



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

JOINT APPLIED PROJECT

**Performance Based Logistics and the
Implications of Organizational Design**

**By: Kristan A. Mendoza
Lisa A. Devlin
December 2005**

**Co-Advisors: Rene Rendon
Cary Simon**

Approved for public release; distribution is unlimited

THIS PAGE INTENTIONALLY LEFT BLANK

REPORT DOCUMENTATION PAGE			<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE December 2005	3. REPORT TYPE AND DATES COVERED Joint Applied Project	
4. TITLE AND SUBTITLE: Performance Based Logistics and the Implications of Organizational Design			5. FUNDING NUMBERS	
6. AUTHOR(S) Kristan A. Mendoza and Lisa A. Devlin				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A			10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES The views expressed in this report are those of the author(s) and do not reflect the official policy or position of the Department of Defense or the U.S. Government.				
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.			12b. DISTRIBUTION CODE	
13. ABSTRACT DoD has directed Military Departments to implement Performance Based Logistics (PBL) as a preferred approach for product support. The purpose of this Joint Applied Project (JAP) is to research and analyze four programs that have implemented PBL to determine what types of organizational designs are conducive to successful implementation, and apply those designs to a program at our command. We will identify organizational structures or characteristics of programs having successfully implemented PBL and then determine to what extent those characteristics are being used or should be used in the Standard Automotive Tool Set (SATS), an (Army) TACOM Rock Island managed program. Research will address current industry practices, Department of Defense policies and guidance, as well as an analysis of organization design on three programs using PBL for product support. Our final recommendation will address whether the characteristics or organizational structure of the SATS team should change to make PBL a successful product support strategy.				
14. SUBJECT TERMS Performance Based Logistics (PBL), Product Support Strategy, Organizational Design, Organizational Design Characteristics, Organizational Design Factors, Organizational Structure, Supply Chain Management			15. NUMBER OF PAGES 101	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT UL	

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18

THIS PAGE INTENTIONALLY LEFT BLANK

Approved for public release; distribution is unlimited

**PERFORMANCE BASED LOGISTICS AND THE IMPLICATIONS OF
ORGANIZATIONAL DESIGN**

Kristan A. Mendoza, Civilian, Department of the Army
Lisa A. Devlin, Civilian, Department of the Army

Submitted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CONTRACT MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
December 2005**

Authors:

Kristan A. Mendoza

Lisa A. Devlin

Approved by:

Dr. Rene Rendon
Co-Advisor

Dr. Cary Simon
Co-Advisor

Robert N. Beck, Dean
Graduate School of Business and Public Policy

THIS PAGE INTENTIONALLY LEFT BLANK

PERFORMANCE BASED LOGISTICS AND THE IMPLICATIONS OF ORGANIZATIONAL DESIGN

ABSTRACT

DoD has directed Military Departments to implement Performance Based Logistics (PBL) as a preferred approach for product support. The purpose of this Joint Applied Project (JAP) is to research and analyze four programs that have implemented PBL to determine what types of organizational designs are conducive to successful implementation, and apply those designs to a program at our command. We will identify organizational structures or characteristics of programs having successfully implemented PBL and then determine to what extent those characteristics are being used or should be used in the Standard Automotive Tool Set (SATS), an (Army) TACOM Rock Island managed program. Research will address current industry practices, Department of Defense policies and guidance, as well as an analysis of organization design on three programs using PBL for product support. Our final recommendation will address whether the characteristics or organizational structure of the SATS team should change to make PBL a successful product support strategy.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

I.	INTRODUCTION AND BACKGROUND.....	1
A.	INTRODUCTION.....	1
B.	PREMISE	1
C.	PROBLEM STATEMENT	2
D.	BACKGROUND	2
	1. What is Performance-Based Logistics (PBL)?	2
	2. How Does PBL Work?.....	3
E.	SCOPE	4
F.	PURPOSE OF THE STUDY	5
G.	RESEARCH QUESTIONS.....	5
H.	IMPORTANCE OF THE STUDY	6
I.	ASSUMPTIONS.....	6
J.	LIMITATIONS	6
K.	SUMMARY	7
II.	LITERARY REVIEW.....	9
A.	INTRODUCTION.....	9
B.	DESCRIPTION OF PERFORMANCE-BASED LOGISTICS.....	9
C.	DOD POLICIES AND GUIDANCE	11
D.	PBL PROCESS	12
	1. Integrate Requirements and Support	12
	2. Establish Implementation Team.....	13
	3. Baseline the System.....	13
	4. Develop Performance Outcomes	13
	5. Select Product Support Integrator (PSI)	14
	6. Allocate Workload	14
	7. Supply Chain Strategy.....	15
	8. Establish Performance-Based Agreements.....	15
	9. Business Case Analysis (BCA)	15
	10. Contract Execution	16
	11. Employ Financial Enablers.....	16
	12. Post Award Responsibility – Assessment.....	17
E.	STATUS OF DOD-WIDE IMPLEMENTATION.....	17
F.	SUPPLY CHAIN MANAGEMENT	19
G.	ORGANIZATIONAL SYSTEMS FRAMEWORK	22
	1. Inputs	23
	a. <i>Environment</i>	23
	b. <i>Key Success Factors</i>	23
	c. <i>System Direction</i>	24
	2. Throughputs	24
	a. <i>Tasks/Jobs</i>	24
	b. <i>Technology</i>	25

	<i>c. Structure</i>	25
	<i>d. People</i>	25
	<i>e. Process/Subsystems</i>	25
3.	Results	26
	<i>a. Culture</i>	26
	<i>b. Outputs</i>	26
	<i>c. Outcomes</i>	26
H.	SUMMARY	26
III.	DESCRIPTION OF SELECTED PROGRAMS.....	29
A.	INTRODUCTION.....	29
B.	THE INTERVIEW PROCESS.....	29
C.	EXPECTED RESULTS	31
D.	THE PBL PROGRAMS	31
	1. F/A-18 E/F Integrated Readiness Support Teaming (FIRST).....	32
	2. AN/ALR-67(v)3 Radar Warning Receivers.....	33
	3. Auxiliary Power Units (APUs).....	33
	4. F404 Engine	34
E.	THE TACOM ARMY SATS PROGRAM	35
F.	SUMMARY	36
IV.	FINDINGS AND RESULTS	37
A.	INTRODUCTION.....	37
B.	RESULTS OF INTERVIEWS.....	37
	1. F/A-18 E/F First	37
	2. AN/ALR-67(v)3 Radar Warning Receivers.....	39
	3. Auxiliary Power Units (APUs).....	42
	4. F404 Engines	46
C.	GAO REPORT.....	50
D.	INTERVIEW RESULTS – SATS IPT	51
E.	APPLICATION TO THE ORGANIZATIONAL DESIGN FACTORS ..	52
	1. People	52
	<i>a. Familiarity with Teaming</i>	53
	<i>b. Communication</i>	53
	<i>c. Reward Systems</i>	53
	<i>d. Fear</i>	53
	<i>e. Upper Management Support</i>	54
	<i>f. Multiple Assignments</i>	54
	2. Processes	54
	<i>a. Training</i>	54
	<i>b. Loss of Productivity and Fear of the Unknown</i>	55
	<i>c. BCA Documentation</i>	55
	<i>d. Assignment of IPT Leader and PSI</i>	55
	3. Structure	56
	<i>a. Cross Functional Teams</i>	56
	<i>b. Support Offices</i>	57
	<i>c. Assignment of PBL Team Leaders/PSIs</i>	57

F.	SUMMARY	57
V.	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	59
A.	INTRODUCTION.....	59
B.	ANALYSIS OF FINDINGS AND CONCLUSIONS	59
1.	People	60
a.	<i>Familiarity with Teaming</i>	60
b.	<i>Communication</i>	60
c.	<i>Reward Systems</i>	61
d.	<i>Fear</i>	61
e.	<i>Upper Management Support</i>	62
f.	<i>Multiple Assignments</i>	62
2.	Processes	63
a.	<i>Training</i>	63
b.	<i>Loss of Productivity and Fear of the Unknown</i>	63
c.	<i>Business Case Analysis (BCA) Documentation</i>	63
d.	<i>Assignment of IPT Leader and PSI</i>	64
e.	<i>Guidance</i>	64
3.	Structure	65
a.	<i>Cross Functional Teams</i>	65
b.	<i>Support Offices</i>	66
c.	<i>Assignment of PBL Team Leaders</i>	66
d.	<i>Assignment of PSI</i>	67
C.	RECOMMENDATIONS AND APPLICATION FOR THE SATS AND OTHER TACOM-RI PROGRAMS.....	67
1.	Current Status of SATS.....	67
2.	Careful Consideration for ACAT III Programs	68
3.	People	68
a.	<i>Use Highly Skilled IPTs</i>	68
b.	<i>Establish Roadmaps for Communication</i>	69
c.	<i>Identify Reward Systems</i>	69
d.	<i>Remove/Prioritize Conflicting Impediments</i>	70
4.	Processes	70
a.	<i>Provide Consistent Training and Guidance</i>	70
5.	Structure	71
a.	<i>Use IPTs</i>	71
b.	<i>Use Support Offices</i>	71
c.	<i>Formal Assignment of PBL IPT Leaders</i>	72
d.	<i>Formal Assignment of the PSI</i>	72
D.	TEMPLATE FOR PBL DECISION MAKING/IMPLEMENTATION ..	73
E.	AREAS FOR FURTHER RESEARCH.....	73
1.	Develop a Measurement Method.....	73
2.	Building the Business Base.....	73
3.	Analyze Navy PBL Guidance.....	73
4.	Title 10 (X) Impact.....	74
5.	Applicability to ACAT III Programs	74

F. CLOSING	74
APPENDIX. TEMPLATE FOR PBL	77
LIST OF REFERENCES	81
INITIAL DISTRIBUTION LIST	83

LIST OF FIGURES

Figure 1.	Organic and Commercial Support Sources (From: PBL, March 2005).....	10
Figure 2.	Organizational Systems Framework.	22

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS

ACAT	Acquisition Category
APU	Auxiliary Power Unit
ASLM	Associate Systems Logistics Manager
AT&L	Acquisition, Technology & Logistics
BCA	Business Case Analysis
CFM	Contractor Furnished Material
CLS	Contractor Logistics Support
CNO	Chief of Naval Operations
DAG	Defense Acquisition Guidebook
DAU	Defense Acquisition University
DBB	Defense Business Practice Implementation Board
DCAA	Defense Contract Audit Agency
DCMA	Defense Contract Management Agency
DLA	Defense Logistics Agency
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDIG	Department of Defense Inspector General
FAR	Federal Acquisition Regulation
FIRST	F/A-18E/F Integrated Readiness Support Teaming
FMS	Foreign Military Sales
FSC	Full Service Contractor
GAO	Government Accountability Office
GE	General Electric
GEAE	General Electric Aircraft Engines
ILS	Integrated Logistics Support
IPT	Integrated Product Team
ISO	International Organization for Standardization
LRIP	Low-Rate Initial Production
NADEP	Naval Aviation Depot
NAVAIR	Naval Air Systems Command
NAVICP	Naval Inventory Control Point
NAVSUP	Naval Supply Command
NPS	Naval Postgraduate School

OEM	Original Equipment Manufacturer
ORD	Operational Requirements Document
PBA	Performance-Based Agreement
PBL	Performance-Based Logistics
PEO	Program Executive Officer
PM	Program Manager
POC	Point of Contact
PSI	Product Support Integrator
QDR	Quadrennial Defense Review
ROM	Rough Order of Magnitude
RWS	Radar Warning System
SAM	Systems Acquisition Manager
SATS	Standard Automotive Tool Set
SEC	Senior Executive Council
TACOM	Tank, Automotive and Armaments Command
TACOM-RI	Tank, Automotive and Armaments Command, Rock Island
USD	Under Secretary of Defense

ACKNOWLEDGMENTS

We wish to acknowledge and express our thanks to the interviewees who provided the data for this paper. We also wish to thank our advisors, Dr. Cary Simon and Dr. Rene Rendon for their guidance and direction.

Finally, we wish to thank our families for their patience and understanding while we spent time in research and preparation of this project.

THIS PAGE INTENTIONALLY LEFT BLANK

I. INTRODUCTION AND BACKGROUND

A. INTRODUCTION

On September 20, 2001, the Quadrennial Defense Review (QDR) directed the application of Performance-Based Logistics (PBL) to new and legacy weapon systems. PBL implementation is mandated by Department of Defense (DoD) Directive 5000.1 (E1.17 directs Program Managers (PMs) to develop and implement PBL strategies that optimize total system availability while minimizing cost and the logistics footprint) (DODD 5000.1, 2003). PBL is a move from contracting for material performance and availability, to contracting for weapon system availability. Instead of buying set levels of spares, repairs, tools, and data, the new focus is on buying a predetermined level of performance to meet the war-fighters objectives.

In accordance with DoD Directives, the Tank, Automotive and Armaments Command (TACOM) offered the Standard Automotive Tool Set (SATS) along with several other systems as potential candidates for PBL strategy implementation in early 2004. With only minimal procedural guidance, TACOM has been struggling through the PBL process. These struggles prompted a further investigation into PBL and the organizations that have implemented PBL. Thus began the search for best practices and lessons learned regarding PBL implementation.

This research investigates four programs that have a fully implemented PBL process in place. PBL is so diverse and is faced with so many challenges, that it would be impossible to complete a comprehensive study of PBL Programs. This research is therefore limited to one particular aspect of PBL, the implications of organizational design on the implementation of PBL programs.

B. PREMISE

Implementation of PBL involves a transformational change from a transaction-based approach to a performance-based approach. Because one of the biggest barriers to change involves the design factors of an organization, we decided to focus our efforts in that area.

C. PROBLEM STATEMENT

Systems Hypothesis: The fit or congruence of organizational design factors shapes the organizational culture, which directly impacts performance (outputs and outcomes) (Nadler & Tushman, 1980).

D. BACKGROUND

1. What is Performance-Based Logistics (PBL)?

PBL is covered in greater detail in Chapter II, however, a brief description is provided to set the stage for understanding the overall topic.

As defined in a Roadshow Briefing prepared by the Office of the Deputy Assistant Secretary of the Army for Integrated Logistics Support (ILS), PBL is “a strategy for weapon system product support that employs the purchase of support as an integrated performance package designed to optimize system readiness. It meets performance goals for a weapon system through a support structure based on performance agreements with clear lines of authority and responsibility.” (DAU TACOM PBL Roadshow, 2004). (Product support is defined as a package of logistics support functions necessary to maintain the readiness and operational capability of a system or subsystem. The package of logistics support functions includes material management, distribution, technical data management, maintenance, training, configuration management, engineering support, repair parts management, failure reporting and analysis, and reliability growth (PBL, March 2005). More simply, PBL is about buying a solution or outcome, not defining the process or method to achieve it. It is about assigning responsibility to the supplier, not the requiring organization. Instead of the traditional role of managing supplies, the government’s role in PBL becomes one of managing the supplier where the supplier has a more active role.

According to a memorandum addressed to the Assistant Secretaries of the Military Departments and signed November 10, 2004 by the Acting Under Secretary of Defense, Michael Wynne, PBL is the Department of Defense (DoD) strategy to improve weapon system readiness and support. Wynne’s memorandum claims that PBL initiatives implemented within the last three years continues to generate significant cost savings and improved capabilities.

2. How Does PBL Work?

PBL is a business practice in which the government contracts for performance that is designed to meet the war-fighter's operational needs. Support objectives are matched with required performance outcomes and available resources. Although PBL contracts may have the tone of service contracts, they are really hybrids of service and supply, which, in concept, encourage the contractor to achieve a high level of performance at a fixed cost. New programs or systems will use PBL to develop, refine, and implement a performance-based strategy during the systems acquisition process. Legacy or fielded systems will be assessed for performance and support alternatives. The establishment of effective business relationships is important to the success of PBL Programs.

The application of PBL will differ from program to program, or system to system, because each has unique aspects. PBL strategies for a specific program or system must be tailored to the operational and support requirements of that system. Almost all of DoD's system support is comprised of a combination of organic and commercial support sources, but the mix of support services differs based on the end item. The spectrum can range from organic support, to total system support provided by an Original Equipment Manufacturer (OEM.)

Although PBL is a relatively new term, its theoretical foundations were formed in the 1980s when increased emphasis on quality came into focus. Mechanisms such as Statistical Process Control, Total Quality Management, and International Organization for Standardization (ISO) certifications introduced scientific methods for obtaining quality control. DoD and industry continually search for the best methods to use scarce resources, including capitalizing on core competencies, outsourcing functions that did not add value, and infusing new technology and innovation. The idea of redesigning government systems acquisition started with the need to form external business relationships and partnerships to share resources and work toward common goals. This mindset has brought about implementation of concepts such as Contractor Logistics

Support (CLS), Public-Private Partnerships, Direct Vendor Delivery, Supply Chain Management, and more recently PBL and Full Service Contractor (FSC) Business Models.

These concepts can be complex. Both supporting and opposing opinion for PBL can be found. The overarching purpose of this study is to advance the understanding of PBL and the effects of organizational design factors on the implementation of this business practice. Knowing that each organization has overcome unique barriers, and that defining clear logistics performance criteria is difficult, the study examines and compares variables from four Navy PBL program offices.

Mechanistic or bureaucratic organizations are complex due to an increasingly diverse workforce consisting of different perceptions, ideas, interests, skills, education levels, genders, and cultures.

Based on studies through the Naval Postgraduate School (NPS) along with real life experiences, characteristics of organizational design have been identified that directly influence systems processes, acquisition strategies, and overall success factors. These lessons and experiences have been used to help analyze both the organizational design and results of four, fully implemented Navy PBL Programs.

The Organizational Systems Framework is a theoretical construct used to describe organizations in terms of inputs, throughputs, and results. Design factors (throughputs) include tasks/jobs, technology, structure, people, and process/subsystems (Roberts, 2000). Using the Organizational Systems Framework as a theoretical foundation, this study analyzes the design factors of four organizations to evaluate how key factors have influenced PBL implementation. Once identified, predicted areas of strengths and areas for possible improvements can be applied to the TACOM SATS Program.

E. SCOPE

Because the topic of PBL is relatively broad and complex, this study focuses primarily on the organizational design factors of four program offices that have implemented PBL programs. Limited case study with some background detail is provided to clarify how the programs were setup and what types of weapon systems are

using PBL. Emphasis of the research rests on the results of interviews with team members that worked PBL programs. Systems theory is used to group data and to determine the extent to which design factors may have contributed to higher or lower levels of performance, i.e., extent of congruence.

F. PURPOSE OF THE STUDY

The purpose of this study is to describe and analyze the organizational design factors that may benefit or hinder PBL implementation. This paper focuses on the specific areas and design factors of structure, processes, and people. Using information obtained from semi-structured interviews with PBL Integrated Product Team (IPT) members, the study identified additional organizational characteristics that appeared to affect PBL implementation in the four Navy programs. Those characteristics were then applied to the TACOM SATS Program to generate recommendations and facilitate implementation. Simply stated, analysis shows whether the organizational design of the SATS team appears more or less conducive to a smooth transition into PBL. Based on this analysis, a template has been formed that may be applied to other TACOM programs. The template allows users to identify organizational design factors that facilitate the use of PBL. Review and analysis of the information collected is intended to advance the understanding of PBL and the effects of organizational design factors on the implementation of this business practice.

G. RESEARCH QUESTIONS

The research questions have been structured to help formulate an understanding of how PBL might fit within the Army and specifically, TACOM. By investigating experiences and applying lessons learned from fully implemented PBL Programs, the chances for success within the Army will increase. The three research questions addressed in this project are as follows:

Question 1: What are the organizational design lessons learned from implementation of four PBL programs, and how can lessons be used to assist leaders and managers in implementing PBL into their programs?

Question 2: What configuration of organizational design elements appear to have positive or negative impacts on implementing TACOM's PBL initiatives?

Question 3: What is the template (identifying organizational design characteristics) needed for successful PBL implementation in TACOM?

H. IMPORTANCE OF THE STUDY

The concept of PBL is modern; however, recent GAO reports suggest that PBL may not be appropriate for application to all programs or systems. (GAO, August 2004) Because of the complexities associated with implementation, GAO contends that PBL should only be considered in certain circumstances, and DoD Directives and guidance should reflect the appropriate criteria for use.

This study is important in order to identify organizational design factors considered to be critical for successful implementation of PBL. The research shows that organization design plays a big role in the way concepts such as PBL are received and executed by leadership and subordinates. Since PBL is mandated by DoD Directive 5000.1, it is time for the Army to move beyond concept and into implementation. This project offers insight to make the transition of managing for performance more effective. Research supports the theory that the success of attributes leading to full implementation depends on the design factors of the organization and how the organization reacts to change.

I. ASSUMPTIONS

(1) PBL is being implemented across all the Services and the Army is being directed to embrace it and move forward. It is not a viable option to ignore PBL.

(2) Although the term PBL is not widely used in the private sector, it appears to have general recognition. For over a decade, the private sector has implemented Supply Chain Management, which contains many of the same characteristics as PBL.

(3) New environments, business practices, and transformation practices face resistance. The change from traditional logistics to performance-based logistics will continue to encounter resistance.

J. LIMITATIONS

This study describes and analyzes organizational design factors that may play a substantial role in successful implementation of PBL. Although PBL is used by all the Services, this research focuses on four Navy programs: the F/A-18 E/F Integrated

Readiness Support Teaming (FIRST), the AN/ALR-67(v)3 Radar Warning Receivers, the Auxiliary Power Units (APUs), and the F404 Engines. This paper focuses on three of the five design factors that makeup the Organizational Systems Framework, specifically the areas of structure, processes, and people.

K. SUMMARY

This chapter explains how PBL came about, outlines the background of PBL, defines the purpose of the study, identifies the scope of the project and the associated assumptions, and addresses the limitations. The purpose and importance should now be clear as we begin the literary review of the PBL process, DoD policy and guidance, the practice of supply chain management, and the Organizational Systems Framework.

THIS PAGE INTENTIONALLY LEFT BLANK

II. LITERARY REVIEW

A. INTRODUCTION

This chapter contains a literary review of Performance-Based Logistics (PBL) and the Organization Systems Framework (Roberts, 2000). It defines PBL and the PBL implementation process. It also includes DoD policy and guidance, status of DoD implementation and current industry practices. The chapter concludes with a description of the Organizational Systems Framework and how it will be applied to data grouping and presentation.

B. DESCRIPTION OF PERFORMANCE-BASED LOGISTICS

PBL is a strategy for weapon system product support that employs the purchase of support as an integrated performance package designed to bring higher levels of system readiness. It describes performance goals for weapon system readiness and encourages the creation of incentives for attaining those goals through clear lines of authority and responsibility. PBL is a move from contracting for material availability, to contracting for weapon system capability and performance. Instead of buying set levels of spares, repairs, tools, and data, the new focus is on buying a predetermined level of capability to meet the war-fighters objectives. More simply put, PBL is about buying a solution or outcome and certain level of performance, not defining the process or method to achieve it (DAG, 2004).

PBL utilizes a performance-based acquisition strategy that is developed, refined and implemented during the systems acquisition process for new programs, or as a result of an assessment of performance and support alternatives for fielded systems. The essence of PBL is buying performance through business relationships that are structured to meet the war-fighters operational needs and match support objectives with required performance outcomes and available resources. The idea is to buy long-term total system support for a weapon system at a fixed level of annual funding. In concept, performance-based contracts encourage the contractor to achieve a high level of performance at an affordable price.

The application of PBL will differ from program to program, or system to system, because each has unique characteristics that impact design and implementation strategies. PBL strategies for a specific program or system must be tailored to the operational and support requirements of that system. Almost all of DoD's system support is comprised of a combination of organic and commercial support sources, but the mix of support services differ based on the end item. The spectrum can range from organic support, where the government performs all maintenance services and manages its own supply chain, to total system support provided by an Original Equipment Manufacturer (OEM), but there are many support strategies in-between.

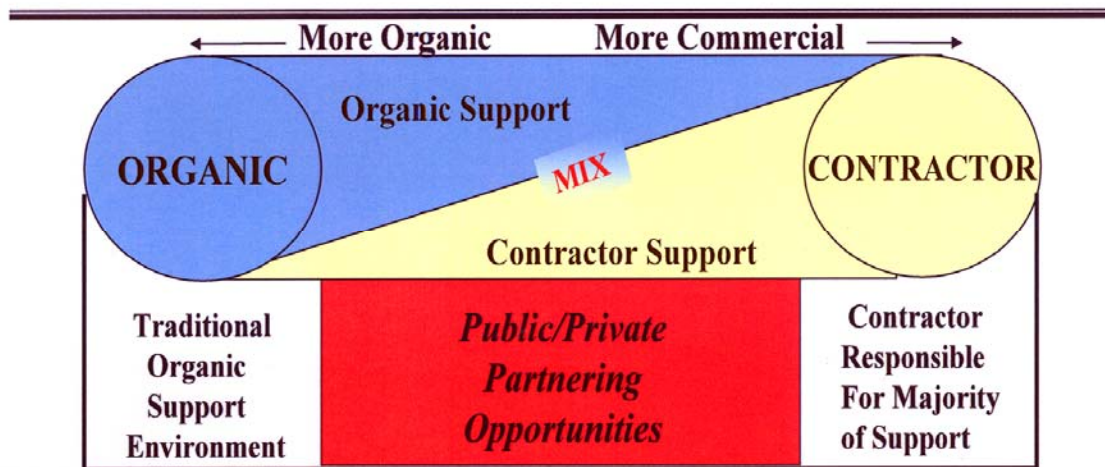


Figure 1. Organic and Commercial Support Sources (From: PBL, March 2005)

For example, the government could choose an inventory based support strategy, buying supplies itself (internally managing the supply chain) and contracting for maintenance services, or issue performance-based contracts allowing the supply chain to be managed by a contractor and have maintenance services performed organically. Whatever strategy is chosen, it seems that the use of PBL allows the government more opportunities to access commercial practices and technology for providing logistics support and allows industry more opportunity to apply innovative approaches to product development and support.

C. DOD POLICIES AND GUIDANCE

The Quadrennial Defense Review (QDR, September 2001) mandated implementation of Performance-Based Logistics and modern business systems with appropriate metrics to compress the supply chain, eliminate non-value added steps and improve readiness for major weapons systems and commodities. Specifically, DoD's strategic goals for acquisition logistics were to project and sustain the force with minimal footprint; reduce cycle times to industry standards; and implement Performance-Based Logistics (QDR, September 2001.)

The Deputy Secretary of Defense issued "Implementation of the Defense Business Practice Implementation Board (DBB) Recommendation to the Senior Executive Council (SEC) on Continued Progress on Performance-Based Logistics" on February 4, 2004. The Defense Business Practice Implementation Board Supply Chain Support Task Group recommended a more aggressive approach to implementing PBL. The Deputy Secretary stated that a delay in implementing PBL complicates funding, limits industry flexibility, and increases DoD inventory. The Deputy Secretary further stated that DoD must streamline contracting and financing to buy availability and readiness measured by performance criteria. He directed the Under Secretary of Defense (USD), Acquisition, Technology, and Logistics (AT&L) to issue guidance on purchasing and using performance criteria. He directed the Military Departments to provide a plan in 120 days, to aggressively implement PBL, and to include the transfer of funding on current and planned systems for FYs 2006-2009 (DoDIG, August 2004).

Performance-Based Logistics (PBL) has been established by the Office of the Secretary of Defense as the new way to acquire and operate support for systems. As evidenced by the Directives noted above, it is the DoD preferred approach for improving war fighter capability, reducing deployment footprint and reducing cost of ownership. The Acting Under Secretary of Defense, Michael Wynne, confirmed this in a November 10, 2004 memorandum addressed to the Assistant Secretaries of the Military Departments wherein he stated that PBL "is the Department of Defense (DoD) strategy to improve weapon system readiness and support." (Under Secretary of Defense, November 2004) Claude M. Bolton Jr., Assistant Secretary of the Army endorsed the Army's use of PBL

in a memorandum dated November 4, 2004 addressed to U.S. Army Commands and Program Executive Offices/Program Managers (PEOs/PMs). (DA, November 2004.)

DoD Directive 5000.1 and the Defense Acquisition Guidebook (DAG) instructs program managers to establish a Performance-Based Logistics approach in fulfilling their product support, integrated supply chain management, and other Life-Cycle Logistics responsibilities. The Directive also states, “To maximize competition, innovation, and interoperability, and to enable greater flexibility in capitalizing on commercial technologies to reduce costs, acquisition managers shall consider and use performance-based strategies for acquiring and sustaining products and services whenever feasible. For products, this includes all new procurements and major modifications and upgrades, as well as reprocurements of systems, subsystems, and spares that are procured beyond the initial production contract award.” (DoDD 5000.1, Para E1.16.) The guide states that Performance-Based Logistics can help program managers optimize performance and cost objectives through the strategic implementation of varying degrees of Government-Industry partnerships. (DAG, Para 5.3, December 2004.) DoD 5000.2 instructs program managers to work with users to document performance and support requirements in performance agreements specifying objectives, outcomes, measures, resource commitments, and stakeholder responsibilities. (DoD 5000.2, Para 3.9.2.4.)

The Directives, Guides, and memorandums from leaders are consistent and clear. DoD will adopt PBL as its primary support strategy.

D. PBL PROCESS

The Defense Acquisition Guidebook lays out a methodology for implementing PBL. There are twelve steps in the process. The following briefly summarizes this process.

1. Integrate Requirements and Support

First, requirements and support must be integrated. Focus must be placed on linking supportability to overall performance. A clear definition of capability needs from the war fighter is required. A factual assessment of current performance in measurable terms is also required. War fighter needs are translated into performance and support metrics which, along with any constraints such as funding, are included in an agreement

between the Program Manager (PM) and the war fighter. This document is called a Performance-Based Agreement (PBA).

2. Establish Implementation Team

Once the PBA is completed, a PBL team should be established. This team develops and manages the implementation. The team should include applicable stakeholders (users or their representatives too), and is led by the PM as total life cycle systems manager. The structure of the team may vary depending on the maturity and mission of the program, however it would be common for a PBL team to cross organization boundaries.

3. Baseline the System

After the team is established, they should baseline the weapon system. Baselineing basically consists of identifying key stakeholders, defining the scope of support required, and defining cost and performance objectives. If systems are fielded, historic readiness rates and operation/support costs relative to the upgraded or new system are required. The difference between the existing and desired performance requirements must be examined. For new programs with no existing logistics structure, the baseline should include an examination of the cost to support the replaced systems. If there is no replaced system, life cycle cost estimates should be used. For existing fielded systems, actual data for sustainment and readiness performance history, and associated operations and support cost is used. The baseline information should be formally documented, as it forms the basis for the business case analysis discussed in a future paragraph.

4. Develop Performance Outcomes

The PBL team focuses on a few outcomes, using corresponding metrics that link to the existing war fighters measures of performance and reporting systems. To be effective, PBL must have associated metrics that reflect the user's needs and are an effective measure of the support provider's performance.

The top-level metric objectives for PBL are defined in USD (AT&L) memorandum dated August 2004, Performance-Based Logistics: Purchasing Using Performance-Based Criteria. They are as follows:

- Operational Availability - the percent of time the system is available for mission.
- Operational Reliability – percent of objectives met, by system.
- Cost per Unit Usage - operational costs/unit of measurement (for example, flight hour, mile driven, etc.)
- Logistics Footprint – “presence” of deployed logistics support (for example, inventory, equipment, personnel, transportation assets, etc.)
- Logistics Response Time – the time from a demand signal to the time of satisfaction. (PBL, March 2005.)

5. Select Product Support Integrator (PSI)

Next, the team develops performance outcomes that focus on user needs – having a system that is operationally available, reliable, and effective, with a minimal logistics footprint and at a reasonable cost. At this point, the PM will select a Performance System Integrator or Product Support Integrator (PSI). The PSI is a single point of accountability for support and may be from the government or private sector. The PSI is assigned responsibility for integrating the efforts of industry and government support providers who are responsible for meeting performance objectives. They will coordinate the work and business relationships necessary to satisfy the performance-based agreements.

6. Allocate Workload

The next step is to develop the workload allocation strategy. According to DoD Directive 5000.1, E1.17, “sustainment strategies shall include the best use of public and private sector capabilities through government/industry partnering initiatives, in accordance with statutory requirements.” (DoD 5000.1, Para E1.17.) The PBL team addresses each discrete workload to assess where, and by whom it can be accomplished. The sourcing decisions must consider existing support processes and infrastructures, as well as evaluation of organic/private best capabilities. The support can be almost totally organic (a Memorandum of Agreement with an organic activity to procure, repair, stock and issue material), a mix of organic/commercial support, or nearly total commercial support. The determination of what the mix should be for any given product or service must also take into consideration public law restrictions on contracting-out some functions. Congress has enacted a number of statutes that restrict the Department’s actions using commercial sector maintenance capabilities. For example, 10 U.S.C. 2464

directs DoD to maintain a core logistics capability to perform maintenance and support of mission essential equipment. Section 2469 stipulates that existing depot-level maintenance or repair workload valued at \$3 million or more must **not** be contracted out or moved to another depot-level activity without using A-76 procedures or DoD depot merit-based selection procedures. Public Law 105-261, section 346 of the National Defense Authorization Act for FY1999, as amended by Public Law 106-65, section 336 of the National Defense Authorization Act for FY 2000, requires a report to Congress prior to the award of a prime vendor contract for depot level maintenance or repair of a weapon system. The report must contain a description of the competitive procedures used to award the contract and an analysis of costs/benefits demonstrating savings over the life of the contract. It must also include an analysis of the extent to which it complies with section 2466 and 2464 mentioned above.

7. Supply Chain Strategy

Next, the team develops the supply chain management strategy (material support), which is a critical step in the implementation process. Supply chain management refers to all of the inter-related components and processes needed to get the correct product in the correct location at the right time. (GAO 04-715, August 2004.) Supply chain management includes distribution, asset visibility, and obsolescence mitigation of spare parts. The supply chain is a key area for utilizing industry flexibility, capability, and proprietary spares support.

8. Establish Performance-Based Agreements

A Performance-Based Agreement is a document that formalizes performance and support requirements, objective outcomes, measures, resource commitments, and stakeholder responsibilities. The implementation team prepares this document to create a clear understanding of the outcomes and commitments required to achieve the outcomes amongst the stakeholders.

9. Business Case Analysis (BCA)

When the strategies have been completed, the team conducts a business case analysis (BCA). The BCA is a cost/benefit analysis to determine an optimal solution. The BCA serves as a formal record of the evaluation of alternatives and the basis of recommended solutions. This analysis is used during the initial decision making process

to select among alternative approaches and to determine whether or not to invest in a project. It is also later used to validate proposed scope, schedule, or budget changes during the course of the project.

10. Contract Execution

Finally, PBL contracts (or Memorandums of Agreement for organic support) should be executed. During this step, commercial PBL suppliers may take on a number of functions normally or previously performed by various DoD services or agencies. These functions may include spare parts requirements determination, physical distribution, warehousing of material, depot level maintenance, and some engineering functions.

DoD encourages teams implementing PBL to utilize Federal Acquisition Regulation (FAR) Part 12 for Commercial Item Acquisition. The preference is to use long-term contracts with Statements of Objectives and incentives tied to performance. Ideally, those contracts would be fixed price, however DoD recognizes that fixed price contracts may increase risk early in the product life cycle when baseline data may not be available. (PBL, March 2005.) Fixed price contracts may also limit the government's flexibility in mission execution as it makes revision to support strategies more difficult, especially in times of military surge. Military services require flexible business relationships because requirements change with time, missions, and world conditions.

The most recent Product Support Guide recommends that PBL contracts contain an exit strategy or criteria to be used at the completion of the contract, or in case the contractor is unable to perform. (PBL, March 2005.)

11. Employ Financial Enablers

When executing PBAs, the Program Manager must implement an enabling financial process. Acquisition of performance is facilitated by single line items and a single type of money. The customer advocates for the required funding. Once the funds have been appropriated, the customer has the responsibility to ensure that the funds are available for the support defined in the PBA, while the PM is responsible for fund management and oversight.

12. Post Award Responsibility – Assessment

After award, the PM has an oversight role of monitoring and assessing performance against the PBA. (Recall that the PBA is the agreement between the war fighter/user and the PM based on capability needs.) A key component of PBL implementation is metrics. Since PBL is basically the purchase of performance, such performance must be tracked, measured, and assessed.

E. STATUS OF DOD-WIDE IMPLEMENTATION

On August 23, 2004, the DoD Inspector General (DODIG, August 2004) issued report #D-2004-110 which documented the status of PBL implementation for U.S. military services. The report stated that “with the exception of the Navy, their (services) efforts were inconsistent, processes were inadequate and uncoordinated, and the results were undeterminable.” (DODIG, August 2004.)

At the direction of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, the Army had initially identified 77 systems, subsystems or components as candidates for PBL implementation. The IG found that some of the 77 systems had partnering agreements or Contractor Logistics Support (CLS) in place before the direction to implement PBL and questioned whether those programs should be included in the implementation metrics at all. Many had not implemented PBL as a result of a Business Case Analysis (BCA), nor did they contain performance goals and incentives. This reporting discrepancy had little bearing on report metrics, however. The actual number of programs for which PBL was implemented could not accurately be determined because the Army lacked a consistent method to determine candidates and then later report on implementation.

The Air Force did not track or even request PBL implementation status information. They could not identify how many programs had implemented a PBL strategy.

Of the three services, the Navy had the most information available and appeared to be the most aggressive in use of PBL strategies. They had issued more than 140 PBL contracts and agreements as of March 2004 and had another 47 in process. (DODIG, August 2004.) (Like the Army, the Navy information contained programs that had

implemented PBL before directed to do so, and thus may not have been the result of a business case analysis or contained performance goals and incentives.) The Navy data system identified the level at which an individual program had implemented PBL and further identified the status by subsystem and single components.

In total, military departments provided data showing PBL implementation for 257 systems, subsystems, or components, however that number included systems initiated before the PBL requirement that might not contain PBL performance goal strategies. The IG report thereby concluded that the number of 257 might be highly overstated. (DODIG, August 2004.)

The DODIG attributed poor progression of implementation to several factors. A primary factor was that DoD had not issued adequate PBL implementation guidance or established sufficient oversight. The Military Departments did not establish training requirements for executing PBL initiatives, thus it seemed that PBL participants did not have a clear understanding of their roles, responsibilities, and implementation procedures, clearly a barrier to successful implementation.

The secondary reason cited by DODIG was that the services lacked a standardized data collection system for tracking and reporting implementation status. The Army and Navy had established their own data collection system but they were inconsistent and generally not adequate. The Air Force had no data collection system at all and thus had no way to measure progress of PBL implementation.

The IG recommended that the Assistant Deputy Under Secretary of Defense (Logistics Plans and Programs), as the office responsible for overseeing the implementation of PBL, finalize written guidance to define PBL terminology and define responsibilities for implementation. They also recommended the same office establish written guidance to better define the process and procedures to develop the BCA (to aid in determination of potential PBL candidates) and to establish a standardized data collection system along with regular reporting requirements.

The recommendations resulted in additional guidance in the Defense Acquisition Guidebook (December 2004), as well as an update to the Product Support Guide (March

2005.) Updated information concerning data collection, reporting requirements, and oversight was not available at the time of this writing.

F. SUPPLY CHAIN MANAGEMENT

Although PBL seems to be a DoD term, utilization of PBL strategies is not limited to DoD. The commercial sector also utilizes PBL strategies, sometimes using the term supply chain management. Recall that supply chain management refers to all of the inter-related components and processes required to ensure that the correct amount of product is in the correct location at the right time. (GAO 04-715, August 2004.)

In an effort to enhance military opportunities to implement PBL, GAO conducted a study in 2004 to determine if DoD policy was consistent with industry best practices. They interviewed 14 private companies that used complex and costly equipment with life-cycle management issues. Those companies were determined to be the most likely to face support issues and decisions similar to those faced by DoD for military systems.

The report states that the private sector used PBL when it was cost effective and reduced risk in a *noncompetitive* environment, at the *subsystem and component level*. PBL is not a preferred tool in the competitive environment because private firms wish to take advantage of competition when it is available, and avoid pass through costs that a prime integrator might charge. Private firms also placed emphasis on securing or maintaining data rights so that they would be protected when the PBL contract was complete or terminated, and they had a need to solicit competition for follow-on support. With limited funding, DoD program managers sometimes opted to spend limited dollars on systems, or system capability, potentially limiting future support options. (GAO, August 2004.) Regarding the private sector's preference to implement at the subsystem and component level, the DoD policy for implementation at the time of the report was at the platform level (even though much PBL implementation may actually have been conducted at the subsystem and component level). GAO contended that PBL at the platform level did not reflect the practices of private sector companies and that DoD's policy for implementing performance-based logistics as a preferred support approach at the weapon system platform level was based on the false assumption that this was an

industry best practice. (GAO, August 2004.) DoD has since revised its policy to reflect the preference for implementation whenever feasible, for systems, subsystems, and spares.

Private sector companies are sometimes reluctant to implement PBL in newer systems. The commercial firms contend that PBL works best for subsystems and components where cost and performance data are sufficient to establish a good BCA. That data is often not available for new systems. In the absence of accurate and reliable information on system performance (such as on new systems) to establish a baseline for evaluating the cost-effectiveness of a performance-based contract, the negotiated price might be excessive. (GAO, August 2004.) For example, if the reliability of the subsystem or component is greater than expected, the PBL arrangement might not be cost effective. This varies somewhat from the DoD policy, which encourages Program Managers to consider support strategies (including PBL) during the design phase of weapon systems.

The private sector generally chooses to retain the systems integration function (management control), viewing it as a core business function, essential to successful business operations. (GAO, August 2004.) DoD guidance does not restrict the selection of a Product Support Integrator (PSI) to the government, although it does assign responsibility for oversight and follow on assessment to the Program Manager.

Private companies use PBL in longer-term contracts, usually sole source because those run 10-12 years, if they have enough historical data to establish an accurate baseline. This is similar to DoD's use of PBL. DoD guidance provides that the preference is to use long-term contracts. The initial investment in implementing PBL can be substantial, requiring up-front investments in reliability or maintainability enhancements causing short term increases in systems costs. (PBL, March 2005) A long-term contract allows for a payback period and a chance to realize gains resulting from the industry-government partnership. In addition, it may be difficult and expensive to exit from a PBL arrangement. Depending on workload allocation, once the PBL contracts are established and contractors take over work that was previously performed organically, the

government frees up the no longer needed resources for other missions. Thus, those resources may no longer be available when the contract ends or is terminated.

Private sector companies that use performance-based logistics, whether fixed price or cost-plus, closely monitor cost and performance information to effectively manage their contracts. (GAO, September 2005.) This is to ensure that the expected costs under the contracts are accurate and meet the company's standards; to validate the business decision used to justify the PBL arrangement; and to obtain the data necessary to renegotiate the contract. DoD also recommends that the military services conduct and update their PBL business decisions by revisiting the Business Case Analysis "as needed throughout the life cycle." (PBL, March 2005.) In fact, one of the guiding principles for a Business Case Analysis (BCA) is that "BCAs will continue through life cycle process with oversight to ensure reassessment at appropriate trigger points...The Services will evaluate PBL performance at appropriate decision points." (PBL, March 2005.) A recent GAO study contends that the services are not validating or revisiting the BCAs. The study analyzed data from 15 weapon systems programs that the military services had identified as having successfully used PBL arrangements. Four of the systems were from the Air Force, seven from the Navy, and four from the Army. (All four programs identified for study in Chapter III were included in the GAO review.) In all but one case, none of the BCAs for the weapon systems had been revisited or updated. (GAO, September 2005.) Information contained in the study indicated that government information systems were inadequate to provide the type of cost and performance information needed to monitor cost and performance, thus they relied on contractor information systems, without knowing whether those systems produced accurate data. GAO concluded that DoD would not be able to evaluate whether PBL arrangements were being implemented effectively and achieving expected results (or savings) until oversight and monitoring procedures were in place to ensure the BCA reviews were taking place.

This concludes the review of the definition of PBL, the PBL implementation process, DoD policy and guidance, status of DoD implementation and current industry practices. The next section of this chapter is a review of the Organizational Systems

Framework, the systems approach this study uses to identify design factors that influence PBL implementation.

G. ORGANIZATIONAL SYSTEMS FRAMEWORK

The Organizational Systems Framework (Roberts, 2000) is a construct used to describe how inputs (environment, success factors, and system direction) interact with throughputs (tasks/jobs, technology, structure, people, and process/subsystems) to influence results (culture, outputs, and outcomes). This model views the organization as a product consisting of a group of interacting elements (Bruner, 1998). As organizations develop, throughputs (design factors) and results provide feedback to the system, further influencing different variables, e.g., feedback loops. Although organization charts vary from one organization to another, the basic structure defines the way the organization communicates and makes decisions.

The following chart gives a breakdown and a brief description of the elements contained in the Organizational Systems Framework:

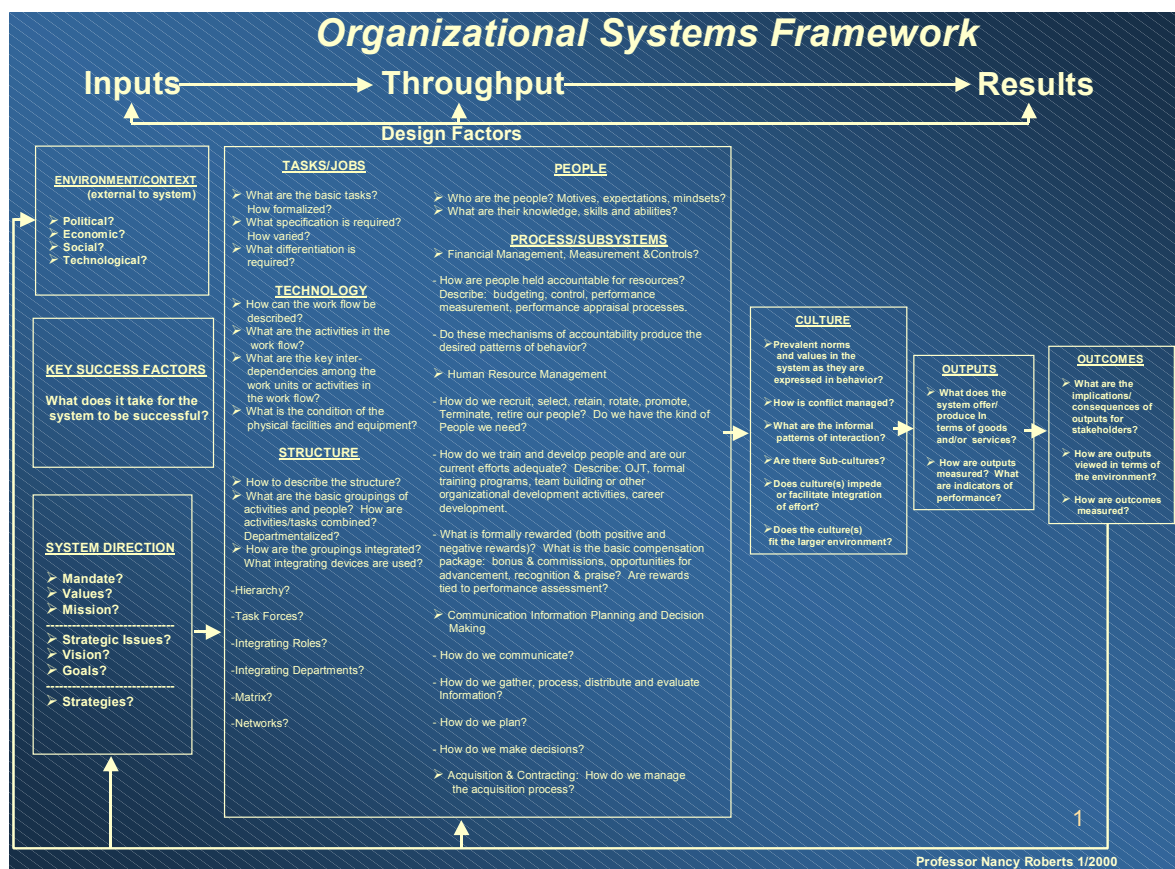


Figure 2. Organizational Systems Framework.

1. Inputs

According to the Organizational Systems Framework, the inputs of an organization are those elements that influence the design factors, culture, outputs, and outcomes of the organization. “They’re the material that the organization has to work with” (Nadler/Tushman, 1988). Basic inputs consist of the following:

a. Environment

According to Roberts (Roberts, 2003), there is a “permeable” boundary that separates the organization from the environment. The organization is constantly interacting with the environment. In order for it to operate at an optimum level, the organization must change and make adjustments as the environment changes. In contrast, there is an impact on the environment as the organization changes. Roberts (2003) makes this point clear in her statement, “Mutual adaptation between the organization and its environment is a basic feature of an open system.” An “open system” is a system that interacts with the environment. Or, as Nadler/Tushman put it, “These elements make up a mechanism that takes input from the environment, subjects it to some form of transformation process, and produces output” (Nadler/Tushman, 1988). Throughput is the process where environmental inputs are processed and converted into outputs. This must take place in order for the organization to survive (Roberts, 2003). Examples of environmental influences are the political/economical/social/technological factors that create opportunities, mandates, and restrictions.

b. Key Success Factors

The key success factors of the organization are the necessary components that must exist for the system to be successful. Key success factors are the methods by which the organization uses its resources, how it strategizes, and how it achieves its mission. Also included are key leader roles, crisis management methods, and the objectives/restraints the organization faces. Each organization is unique and therefore consists of different factors that make it successful. It is common that success factors of a private firm will be more distinct and defined than those of public organizations (Bruner, 1998).

c. System Direction

There are implicit and explicit elements influencing an organization's direction. System direction is a lever that espouses where the organization is headed. Examples of system direction mechanisms are the mission, values, beliefs, vision, goals, and strategies of the organization. Identifying and clarifying direction can be the first charge of leadership. The mission is what the organization does, for whom, and how tasks are accomplished. The values and beliefs are implied or written and can be described as the "mode of conduct" that the organization supports (Roberts, 2003). The vision is how the organization sees itself in the future. It defines the efforts required to achieve success. Goals are the actions that will be achieved; however, they differ from objectives in terms of specific actions expected to be accomplished within a specific timeframe. Strategies spell out how the organization will get from a current state to a desired future state. According to Roberts, strategy "is usually described in terms of a ploy that is pursued to outmaneuver opponents or competitors, or a position the organization takes in terms of markets or customers, or a perspective assumed in terms of its theory of doing business. Strategy can be intended as in a plan that looks ahead to the future, or strategy can be realized from a pattern of activity that emerges over time." (Roberts, 2003)

2. Throughputs

Throughputs are the design factors that convert inputs into outputs, outcomes and organizational culture. These are often the internal workings of an organization that interact in ways that can be congruent or incongruent, thereby depicting the hypothesis that "fit" determines performance. Throughputs are described in more detail as follows:

a. Tasks/Jobs

Tasks are designed according to the nature of the work to be performed. Each organization is designed differently, and therefore each job contains different, specific, and unique task arrangements. The organization is set up to perform tasks that are consistent with the strategies. The skills required to perform the work, the types of rewards the work provides, and the constraints in place are what make up the analysis of the tasks (Nadler/Tushman, 1988). The level of understanding of those tasks within the

organization and how well the tasks fit with other design elements are an integral part of the systems framework.

b. Technology

Technology plays a crucial part in converting inputs to outputs. There are different types of interdependencies (pooled, sequential, or reciprocal), which categorize how work flows within each organization. Technology is how the work gets done and how it progresses through a cycle. When accomplishing various tasks, technology is one element that determines how the organization produces outputs. Technology also consists of the equipment and physical facilities being used to accomplish tasks. (Roberts, 2003)

c. Structure

The structure of an organization consists of “the basic groupings of activities and people” (Bruner, 1998). Structure includes the fundamental shape, integrating devices, and coordinating methods that pull the various groupings together. Activities and tasks are combined to form and define the structure, based on the hierarchy, task forces, matrix, networks, integrating roles, and integrating departments within the organization. (Bruner, 1998)

d. People

This design factor is characterized by the knowledge, skills, abilities, motives, expectations, and mindset of the people in the organization. Experience base, education, and demographic background are also considered as part of this element.

e. Process/Subsystems

This design factor contains various facets including accounting, financial, and payroll processes. It also includes the following sub-elements:

- Human Resource Management – how the organization recruits, selects, promotes, terminates, retires, retains, rotates their people – how the organization trains and develops people – how formal rewards are presented – how compensation is granted.
- Financial Management, Measurement & Controls – how people are held accountable for resources – affects of accountability mechanisms on behavior.

- Communication Information Planning and Decision Making – how information is communicated for planning and decision making purposes – how information is gathered, processed, distributed, and evaluated
- Acquisition & Contracting. How the acquisition process is managed.

3. Results

Results are comprised of the culture, outputs, and outcomes that are achieved after the inputs have influenced the throughputs, and the design factors (throughputs) have gone through the conversion process. Organizations are measured for efficiency and effectiveness based on the results they generate. The culture, outputs, and outcomes are defined as follows:

a. Culture

Culture describes how the people within the organization interact, manage conflict, and treat one another. Culture also has a bearing on the way the organization fits the larger environment. Many organizations contain subcultures that can impede or facilitate the integration of efforts (Roberts, 2003).

b. Outputs

The goods and services the organization produces are the outputs. Outputs are measured based on how well the organization uses its resources and whether they meet their objectives. Outputs are based on the method of measurement, which result in the organization's performance indicator. (Bruner, 1998)

c. Outcomes

“Outcomes deal with the implications and consequences that outputs have on stakeholders and how the outputs are interpreted in view of the environment. In order to be an integrated system, the outcomes must feedback to the environment and also to the design factors.” (Bruner, 1998)

Through the Organizational Systems Framework, this study analyzes the three specific design factors (throughputs), people, process, and structure of four different organizations to show how those factors influenced the way PBL was implemented.

H. SUMMARY

This chapter describes PBL and the PBL methodology. It contains a literary review of the 12-step process for implementation, DoD policy, industry practices, and the

implementation status within the DoD services. This chapter also describes the Organizational Systems Framework and identifies the design factors that convert inputs into outputs. The next chapter explains the interview process and gives a general description of the four Navy PBL Programs as well as the Army's Standard Automotive Tool Set (SATS) Program at TACOM.

THIS PAGE INTENTIONALLY LEFT BLANK

III. DESCRIPTION OF SELECTED PROGRAMS

A. INTRODUCTION

This chapter discusses the interview process, expected results, the four PBL Programs, and the TACOM SATS Program. The strategy of the interview process is designed to uncover details about the organizational design factors of people, processes, and structure of the program offices that implemented PBL.

B. THE INTERVIEW PROCESS

Five interview questions about PBL and organizations have been developed for the Navy PBL Programs. With these questions, semi-structured interviews were conducted with personnel from four Navy program/project offices who have fully implemented PBL support strategies. The interviews consisted of upper management, middle management, and functional program managers from each of the four Navy programs identified earlier. The interview questions were sent to interviewees via email. Once all written interviews were completed and reviewed, each interviewee was contacted for follow-up questions/clarifications.

The interview questions are as follows:

- (1) How is your organization structured?
- (2) How did your structure change as PBL was implemented (or did it)?
- (3) What organizational design elements had a positive or negative impact on PBL implementation?
- (4) If you could go back and change anything during the implementation phase, what would it be and why?
- (5) What post-PBL implementation results have you seen or experienced?

Question 1: How is your organization structured? Through this question, information was gathered to find out if the team(s) were structured as Integrated Product Teams (IPTs) or if they worked in stovepipe organizations. If they were IPTs, what functions were represented and how were the functions separated. Identification of the Product Support Integrator (PSI) or Associate Systems Logistics Manager (ASLM) was also requested for each program. Final analysis focuses on the understanding of the organizational motives, relationships, expectations, and mindsets of each interviewee(s).

Question 2: How did your structure change as PBL was implemented (or did it)?

By identifying how the organization was perceived before and after PBL, interview results show the changes and the positive/negative affects. Interview results also defined whether the teams were already in place (and had to adapt accordingly) or if they were formed solely for the PBL effort. Follow-on discussions included training issues, intended/unintended consequences, and strategies for success.

Question 3: What organizational design elements had a positive or negative impact on PBL implementation? Organizational design is defined based on the environment, technology, personalities, available resources, norms, tasks, and many other elements. By choosing subject matter experts to interview, accurate details were captured that help distinguish the characteristics that led to success.

Question 4: If you could go back and change anything during the implementation phase, what would it be and why? Hindsight is 20/20, but learning and improvement comes from experience. As interviewees identified the factors that contributed to the successful effort and issues that restrained their efforts, lessons-learned were formed. The results spell out the short term and long term implications and the elements believed to be the biggest challenges/obstacles.

Question 5: What post-PBL implementation results have you seen or experienced? With this question, we were looking for the gaps between the intended gains and the identifiable outcomes.

The interview questions were specifically designed to capture the opinions, attitudes, and experiences of the subject matter experts that worked the Navy programs. The respondents were guaranteed that their names would not be used in any portion of this report or divulged to anyone outside the project. The information gathered from the interviews was solely used to develop a general understanding and analysis of the organizational design factors and leadership traits of each group as they worked toward fully implementing a PBL program.

Once the interviews were completed, analyzed, and the design factors of the organizations identified, those factors were applied to the Army SATS Program. Semi-structured interviews were conducted with SATS team members and consisted of the following questions:

- (1) How is your organization structured?
- (2) What is your attitude toward PBL?
- (3) What significant changes has your organization experienced in the past five years, and how were they received?
- (4) How do you feel about contracting for performance when the support strategy has traditionally been organic?

C. EXPECTED RESULTS

Although the four Navy programs were totally different efforts, they were all performed under the same service, and they all generated measurable results. Common organizational design factors exist within each of these programs, and those common factors contributed to successes. The design factors of teaming, training, and leadership are distinct areas of organizational design where commonalities appeared. We were able to identify the characteristics that led to success by carefully analyzing the design elements of the organizational systems framework as they pertained to each of the program offices investigated.

D. THE PBL PROGRAMS

The research was conducted on four Navy programs that have fully implemented Performance-Based Logistics. The original intent was to research and analyze three Army programs, but initial reviews indicated that the Army was lagging behind the other services in implementation. In order to explore the organizational structure of programs using PBL fully, it became necessary to analyze programs in which PBL has been fully implemented and lessons learned are available. Further, all four programs have been selected from one military service (Navy) to avoid inconsistent data resulting from the differences in procedures from service to service.

The four Navy programs that have fully implemented PBL are identified as follows:

- (1) The F/A-18 E/F Integrated Readiness Support Teaming (FIRST)
- (2) AN/ALR-67(v)3 Radar Warning System (RWS) Receivers
- (3) Auxiliary Power Units (APUs)
- (4) F404 Engines

These programs are briefly described below.

1. F/A-18 E/F Integrated Readiness Support Teaming (FIRST)

The single seat F/A-18E and two-seat F/A-18F Super Hornets perform a variety of missions including day and night strikes with precision-guided weapons, fighter escort, suppression of enemy air defense, reconnaissance, forward air controller and tanker. The aircraft has 11 weapon stations, which allow for a significant degree of payload flexibility with the capability to carry a variety of both air-to-air and air-to-ground ordnance on one mission.

The F/A-18 E/F FIRST program was designed to improve readiness and lower support costs for the F/A-18 E/F Super Hornet. The FIRST vision statement was to: “Develop and implement an F/A-18E/F support plan that will achieve and sustain CNO readiness goals and provide significant reductions in weapon system ownership cost through government/industry partnership, supply chain management, reliability engineering/improvement, integrated information systems, Hornet support network, and performance-based contracting.” (F/A 18E/F Powerpoint, undated) With NAVICP acting as the Product Support Integrator, the Navy awarded Boeing a two-year contract for approximately \$252 Million in May 2001. With options, the total contract amount could reach \$750M over a five-year period. Under this contract, Boeing provides full logistics support including supply chain support, reliability improvements, obsolescence management, technical publication, and support equipment management for approximately 850 components unique to the F/A-18E/F aircraft. (Navy is responsible for components that are common to E/F, and C/D. DLA was the primary source of common consumables.) Under this “partnership”, the Navy retained configuration control, system safety, base-supply (or retail) material allowances, and organizational, intermediate and depot maintenance. Naval Aviation Depots provided touch labor needed for repairs and upgrades under commercial services agreements with Boeing.

Reported metrics such as the increase in material availability (from 62% to 85%), the successful launch rate (97%), and the reduction in repair cost per hour indicate that the Navy has already reduced total cost of ownership while substantially increasing readiness of the system.

2. AN/ALR-67(v)3 Radar Warning Receivers

The ALR-67(v)3 Radar Warning System (RWS) provides advanced techniques to detect threat radar emitters. It enhances the survivability of aircraft and aircrews by providing improved situational awareness in complex electronic warfare environments. This includes emitter identification, extended capabilities in detection and processing, threat location, and potential lethality. This Radar Warning System is used on the F/A-18E/F and C/Ds.

In September 1999, NAVICP awarded a six-year, \$58.5 million performance-based logistics contract to Raytheon Systems Sensor and Electronics Division, Goleta, CA. At the time of the award, the RWS was a new, non-fielded system for which no organic production or repair capability existed. Under this contract, Raytheon is the full service provider with the Navy retaining integration responsibility. Raytheon's responsibilities include reliability improvements, maintenance of wholesale inventory, obsolescence management, and configuration management. The structure of the contract is designed to provide incentives for Raytheon to use best commercial practices and to pioneer innovations and efficiencies to further reduce total life cycle costs.

3. Auxiliary Power Units (APUs)

Another PBL effort that supports the F/A-18 is the contract with Honeywell for the Auxiliary Power Units (APUs). This PBL effort supports four different APUs used on the C-2, F/A-18, S-3, and P-3 aircraft. The contracts are set up as 10-year, firm fixed price public/private partnerships between NAVICP, Navy Aviation Depot (NADEP) Cherry Point and Honeywell. The APU efforts are referred to as "Power-by-the-Hour" because of the aggressive Total Logistics Support strategy. The contract includes incentives for Honeywell Defense and Space to provide continuous process improvements for the APUs, along with associated logistics support.

Under the contract, Honeywell is responsible for 90 percent on-time delivery. They are committed to routine stock replenishment in the U.S. within five days, priority shipments within two days, and outside the U.S. within 4 days (compared to an average of 35 days under past agreements). Incentives include payment adjustments if the metrics are not met. This PBL contract has a “storefront” concept for material management, with restored configuration stability. Ninety-eight percent of the requisitions are filled within the contractual requirements. Supply material availability at depots has increased to 95%, with zero repairs awaiting parts.

This PBL program provides distribution, inventory, component repair and overhaul, component reliability management, guaranteed availability, program management, training/information management options, and predictable price and performance. The scope of these PBL efforts results in a guaranteed service level and is also considered to be one of the best commercial practices in tailored DoD customer solutions.

4. F404 Engine

The F404 is a family of engines that has powered multiple aircraft since the 1980s, performing a broad spectrum of missions from low-level attack to high-altitude interceptors. In August of 2003, the Naval Air Systems Command (NAVAIR) awarded a five-year, Performance-Based Logistics (PBL) contract to General Electric Aircraft Engines (GEAE). The contract value was estimated at \$510 million. It also contains a five-year option period estimated at \$600 million if exercised. The contract was drafted to support the Naval Aviation Depot’s F404 engine repair lines, which depend on an uninterrupted flow of piece parts for ready-for-issue engines, modules, and components. Under this contract, GEAE is to provide full logistics support including supply chain support, reliability improvements, and obsolescence management. The Navy retained configuration control and the Naval Aviation Depot (Jacksonville) provides touch labor for repairs under a commercial services agreement with GEAE. Established metrics include availability and reliability.

E. THE TACOM ARMY SATS PROGRAM

The Army's SATS Program is an Acquisition Category (ACAT) III program and was selected as a PBL candidate in 2004. A minimal amount of effort has been expended to push the SATS through the steps toward implementation of PBL. Clear guidance has not been provided through the Army channels to facilitate implementation in a reasonable amount of time. The SATS IPT team has continued to operate under a traditional IPT structure, utilizing the organic support system.

The Standard Automotive Tool Set (SATS) is a modular concept designed to "replace the most common organizational and direct support tool sets." (PEO Memo, 2004). The SATS consolidates the Army's antiquated basic automotive tool sets into an easily inventoried, single standardized, mobile and quickly deployable tool set that supports all levels of automotive maintenance. The concept makes the set C-130 deployable and significantly optimizes the logistics footprint, which supports the two-level maintenance and Army's transformation for the future. The SATS is a containerized shop set, consisting of a core set and various modular packages to support a unit's field level maintenance mission (PEO Memo, 2004).

The initial SATS IPT formed sometime in 2001 when the SATS was a conceptual system. The first three years were spent investigating and defining the Army's fielding requirements and developing the Operational Requirements Document (ORD). Once the ORD was in place, staffing of the Milestone Decision package began. As the organization underwent a landmark transformation to become its own Product Manager, the SATS IPT team worked to familiarize themselves with the Milestone Decision process and all associated requirements documentation.

Because this was an integration effort, staffing began at Milestone B. While the Milestone Decision documentation was being staffed, the requirement for SATS was competed among a pre-established pool of qualified contractors. After well over a year's effort, Milestone B was approved, and the successful contractor was authorized to enter into Low-Rate Initial Production (LRIP).

Just before the Milestone B package was sent to the Program Executive Office (PEO) for approval, a new PEO was assigned. The new PEO selected the SATS as a PBL candidate. A single point of contact (POC) (outside the IPT but within the TACOM organization) was assigned to process and report on PBL efforts. This POC coordinates primarily with the Systems Acquisition Manager (SAM) to gather data for PBL reporting. To date, the SATS PBL has been processed through a series of steps to determine appropriate course of action.

F. SUMMARY

This chapter explained the interview process and the methods to be used for gathering data from the subject matter experts, along with expected results. It has also provided a brief description of each of the programs that have implemented PBL and a description of the TACOM SATS Program. The next chapter describes the interview results and contains the findings as they relate to the organizational design factors and implementation of PBL.

IV. FINDINGS AND RESULTS

A. INTRODUCTION

This chapter describes the results of interviews with individuals from the four PBL Programs and the Standard Automotive Tool Set (SATS) IPT described in Chapter III.

B. RESULTS OF INTERVIEWS

Points of Contact (POCs) were identified from three levels (upper management, middle management and functional) for each PBL IPT. There were a total of 17 POCs for the four PBL IPTs and five POCs from the SATS IPT. Initial contact was via email. Each POC for the four PBL programs was forwarded the same five questions. The questions for the SATS IPT members were slightly different, as the SATS team has not yet implemented PBL. Email reminders were sent and follow-up telephone calls were placed in an attempt to involve participants who did not respond. Seven of those who did not respond to the initial request, did not respond at all. Follow-up telephone interviews were conducted to obtain clarification and insight into additional areas of interest that surfaced in email responses. The results are first grouped by program and interview question, and then by the organizational design factors of structure, people, and processes. The data presented is a combination of information obtained from the email responses and follow-up telephone interviews.

1. F/A-18 E/F First

Three individuals on the PBL IPT team for the F/A-18 E/F were contacted, one each at the upper management, middle management and functional levels. The two individuals from the upper and middle manager levels did not respond. The individual who responded participated in the IPT as a contract specialist. A follow-on interview was conducted via phone after the initial electronic response.

Question 1: How is your organization structured?

The interviewee explained that the initial PBL implementation team consisted of approximately 30 people representing the stakeholders of NAVAIR, NAVICP, the repair depots, the prime contractor and major subcontractors, Defense Contract Audit Agency

(DCAA), and Defense Contract Management Agency (DCMA). They were not co-located. The 30 individuals were specialists from various disciplines. Specifically named were metrics specialists, support equipment specialists, repair specialists, and fleet operations specialists. Some team members were assigned to the F/A-18 E/F PBL effort full time, while others were expected to participate on the team and fulfill other job assignments simultaneously. The team initially met off-site to minimize distractions from other duties.

In addition to the PBL implementation team described above, the organization also included an Executive Steering Committee made up of the highest level of team members. This steering committee met regularly to track and ensure progress, and “strategize future actions.”

During the follow-on interview, this IPT member was asked to identify the PSI. He stated that he did not believe that specific term (PSI) was used, but described the Program Manager as being primarily responsible for ensuring “that everything to keep the plane flying gets done.”

Question 2: How did our structure change as PBL was implemented (or did it)?

The interviewee responded that the FIRST team was created solely for the PBL effort. The F/A-18 E/F was a new aircraft at the time PBL was implemented, therefore no pre-existing traditional support or organic repair. There were no significant changes to the organization as implementation occurred.

During the follow-on interview, the IPT member was queried about PBL training. He stated that the IPT did not receive any group or formal training.

Question 3: What organizational design elements had a positive or negative impact on PBL implementation?

The interviewee stated that during initial off-site IPT meetings, teams were assigned action items with due dates. The team leader was responsible for ensuring that the team completed the action item. He said those assignments led to accountability, which was invaluable.

The interviewee also mentioned that individual personalities of team members had a positive effect on implementation. He explained that the team make-up promoted progress because it included some high level members who were motivated, dedicated, cooperative, and strong willed.

Question 4: If you could go back and change anything during the implementation phase, what would it be and why?

The interviewee stated that if he were to change anything during implementation, it would be the contract period as it related to funding streams. The FIRST contract period was on a fiscal year basis, however some of the funding streams were not made available until well into the first quarter of the fiscal year, clearly an impediment to performance.

The IPT member also identified senior management level buy-in as a factor that contributed to success. He stated that although they attempted to keep senior level managers informed as the program progressed, there were still some “hiccups” and if he were to change anything about the process, it would be to go “overboard” in this area.

Question 5: What post-PBL implementation results have you seen or experienced?

The interviewee stated that the fleet is satisfied with the support they receive from implementation of PBL. He also stated that the BCA had been updated with a revised “gain” amount, and the analysis still showed PBL as “a winner.” He was not aware of any PBL efforts that have not resulted in a break even or better situation.

2. AN/ALR-67(v)3 Radar Warning Receivers

Interview requests were sent to five team members who participated on the AN/ALR-67(v)3 Radar Warning System (RWS) PBL IPT. One person responded to the request via email. A second individual agreed to participate in a short telephone interview. The two interviewees were functional level team members from the contracting and logistics fields. Three people (one from each upper, middle, and function level) did not respond.

Question 1: How is your organization structured?

The organization consisted of multiple Acquisition Planning Teams (APTs) that managed systems at a broad level. When the PBL effort was initiated, a PBL IPT was formed as an extension of their APT. The PBL IPT works specifically on the PBL contracting arrangement for the Radar Warning Receivers. The PBL IPT consists of subject matter experts (SMEs) in the areas of contracting, logistics, program management, item management, hardware NAVAIR, Navy Supply Command (NAVSUP), and contractor staff. The IPT team was formed at inception of the PBL assignment, and they are still intact today. Program Management Reviews (PMRs) are conducted every six months.

There was inconsistency in responses from the interviewees when asked who lead the IPT. One stated it was the avionics PBL team leader, and the other said it was the contracting team leader. The response was similar when asked who was assigned as the Product Support Integrator (PSI). One named an individual from the Supply Chain Solutions Office, and the other person did not know. Both interviewees stated that they were unfamiliar with the term PSI and thought that the Navy used another term to identify someone in a PSI role, however, they were unable to provide the term.

The interviewees were asked who was responsible for completing the Business Case Analysis (BCA) and if the IPT was aware of the BCA contents. The interviewees responded that a group called the “price fighters” prepared the BCA for the Supply Chain Solutions Office, and that the IPT members are fairly familiar with its contents. They added that the BCA is populated based on a Rough Order of Magnitude (ROM) submitted by the PBL contractor.

Question 2: How did your structure change as PBL was implemented (or did it)?

The structure changed minimally as the teams became more defined under the PBL effort. The PBL team consisted of 10-12 core members and also included the contractor. Additional subject matter experts (e.g. engineering, technical, attorneys, quality, etc.) were called in when necessary.

The interviewees reported that the IPT received minimal formal or informal PBL training. A short kickoff training session was conducted, and there may have been some other initial training when PBL started. Interviewees were unsure who conducted the kickoff training (it may have been the Supply Chain Solutions Office.) They added that personnel in their organization are becoming more knowledgeable about PBL as their level of involvement and the experience with PBL increases.

Question 3: What organizational design elements had a positive or negative impact on PBL implementation?

The interviewees reported that the continuity of team members from the APT to the IPT had a positive impact on the overall success of PBL implementation. The PBL IPT worked very well together, and their efforts were supported by great leadership. Attitudes were positive, dedication was high, and the team acted as a cohesive unit.

Interviewees provided information on a formal and informal reward system. They stated that upper management recognized PBL team efforts by giving out team performance awards. Team members also received increased exposure for promotions and other job assignments based on the experiences they gained working on the PBL team.

Interviewees reported that although there may have been some apprehension initially, there was no longer any negativity or fear associated with the possibility of contracting themselves out of a job. No one has been displaced due to PBL implementation, however, many job duties have shifted.

The IPT members were assigned to the PBL effort in addition to their regular duties. Managing the new assignment, as well as the pre-existing responsibilities, may have had some negative impact. Team members prioritized and managed their workload as efficiently as possible so that neither the pre-existing workload nor the new duties suffered.

Question 4: If you could go back and change anything during the implementation phase, what would it be and why?

The interviewees reported that one of the biggest challenges was communication. There were many instances where last minute issues/questions became showstoppers. This could have been avoided if communication had been more specific and timely, and by making sure all levels of management and the necessary players were informed of progress. Subject matter experts should be brought in during the implementation phase so they are familiar with the phases, goals, and objectives.

Question 5: What post-PBL implementation results have you seen or experienced?

One interviewee reported that the team negotiated equitable adjustments because projections for repairs, materials, pricing, and support were overly optimistic. Other changes and production problems also contributed to the negotiation of equitable adjustments.

There were also gaps between initial flight hour projections and what was actually experienced. There was a contract provision to decrement the award fee if the percentages fell short of the projections. Although the contract specified a minimum acceptable level of performance and that level was met, there were incentive goals that the contractor was unable to meet.

The interviewees reported that the Supply Chain Solutions Office has initiated a Lean Six Sigma effort for the PBL implementation process. Currently, the average time to implement PBL is two years. The Lean Six Sigma team hopes to reduce the implementation time to 14 months.

3. Auxiliary Power Units (APUs)

Interview requests were sent to three team members who participated on the Auxiliary Power Unit (APU) PBL. Two team members responded. The two individuals who responded were at the functional level. Their functions on the team were that of logistician and policy/staff support. The individual who did not respond was from the middle management level.

Question 1: How is your organization structured?

The two interviewees were consistent in their description of the organizational structure. The organization operated in an IPT environment. The APU IPT was created specifically to implement PBL and consisted of specialists from various functions (engineering, contracting, logistics, quality, contractor staff, depot, etc.). Although the APU IPT members were accustomed to working in IPTs, they were not familiar with PBLs and had never worked as an IPT on a PBL Program. The policy/staff interviewee indicated that the APU PBL assignment was in addition to other duties and that his office (Supply Chain Solutions) was responsible for processing the Business Case Analysis (BCA).

The original IPT was not co-located and thus conducted some team meetings through virtual (electronic) IPTs. The interviewees stated that this means of conducting meetings seemed to have somewhat of a negative impact on the amount of time it took to process actions/issues.

The interviewees were asked who was assigned the role of Product Support Integrator (PSI). The logistics/program manager responded that he acted as the IPT lead, as well as the PSI. The other interviewee responded that the weapon system manager was always the IPT lead, and the weapons team acted as the PSI.

Question 2: How did your structure change as PBL was implemented (or did it)?

The interviewees saw no major changes to structure as implementation occurred. As the PBL initiative was formed, however, the IPT became more structured and orderly to accommodate the new mission. Both individuals indicated that the original IPT was too large. In order to be more effective, upper management directed the IPT be pared down to a manageable working group of 10-12 core members. Both interviewees agreed that once the core IPT was established, the group was much more efficient and productive.

The interviewees reported that formal training is provided to the IPT members and contractor staff. This kickoff training is conducted by a staff support group called the Supply Chain Solutions Office, but it has only recently become available. During the

formation of the APU PBL IPT, there was no formal training available, and there were no mandatory Defense Acquisition University (DAU) course requirements. One interviewee reported that most logisticians and program managers have completed the Acquisition, Technology, and Logistics (AT&L) Workforce Certification requirements and are certified at Level III in Acquisition Logistics. He also stated that, within the certification requirement, there is a logistics class that focuses primarily on PBL (LOG 235).

There were no personnel reductions as a result of implementation of PBL, but there were shifts in responsibility. There was no major concern that the effort would negatively impact government jobs; however, the IPT members were initially apprehensive because the change to PBL put them out of their comfort zone.

Question 3: What organizational design elements had a positive or negative impact on PBL implementation?

One interviewee stated that the “persistent personalities” of IPT members contributed to the success of the PBL effort. Especially noteworthy were the persistence of the senior executive officer and the lead contracting official. These individuals had a vision that 100% of General Electric (GE) engines would be PBLs, and 80% of repairables would be PBLs. Both interviewees felt that their constant push had a positive impact on the team communications, maintaining the needed strength and consistency for successful implementation of PBL on this program.

Upper management was very supportive, and this proved to be a key element, especially as the team worked through the confusion and lack of enthusiasm in the initial stages of implementation. The personnel in the organization have become more receptive to PBL as the level of experience has increased and the guidance has become more available.

One factor that began negatively ended up having a positive impact. Interviewees were asked if IPT members were apprehensive about PBL because of a possible risk of “contracting themselves out of a job.” Although they have seen a shift in responsibilities as duties/focus changed, there has not been any displacement of government personnel.

They added that the PBL effort actually turned out to be an effective method in dealing with reduced human resources and an increased workload.

Question 4: If you could go back and change anything during the implementation phase, what would it be and why?

Both interviewees felt they should have structured a leaner IPT earlier than they did. They found it was difficult to manage the team or get things done because there were too many conflicting personalities and priorities. They stated that if they could do it over, they would suggest that all stakeholders be brought together for an initial meeting, and then establish a “lean” IPT, possibly with sub-IPTs if necessary.

Both interviewees also mentioned problems with metrics. They responded that metrics should have been structured and defined differently. The APU PBL program used reliability metrics, which were difficult to assess. Also, during the initial stages, the IPT assumed reliability to be better than it actually was. One of the interviewees attributed this to ECPs that would have affected reliability, but were not implemented in a timely manner. As a result, the contractor experienced more failures than predicted. The interviewee felt this put the contractor in a position where it would be impossible to receive incentive payments because they could not meet the contract metrics. During the first few years, the contractor was trying to “dig themselves out of a hole” and was actually in a situation where they could have been penalized. If they could do things over, the team would “consult with metrics and reliability experts...or do away with reliability metrics entirely...” They suggested that “availability” might have been a better measurement because, in a firm fixed price contract, the contractor is inherently incentivised to improve reliability. To explain further, if the APUs last longer, the contractor is responsible for providing fewer units, thus profit to the contractor increases. As a result of these issues, the Supply Chain Solutions Office is now in the process of refining the link between wholesale to retail metrics.

One interviewee responded that there was a great loss of time initially working toward a sole-source arrangement, a concept proposed by the PBL provider. A considerable amount of time was lost working through the Title 10 issues of depot core

workload. The strategy was later revised and ultimately evolved into a partnership agreement between the PBL contractor and the depot. If they were to do it over, they would have started with the partnership concept. It may have required more interaction with the depot up front (initially, the depots were apprehensive about the change because they felt it would be taking their work away), but ultimately would have saved the two years of wasted time spent pursuing the sole source arrangement.

Finally, one interviewee mentioned that the team realized, in hindsight, they could have benefited from an expanded base and potentially lower costs had they engaged Foreign Military Sales (FMS) customers immediately in the implementation process.

Question 5: What post-PBL implementation results have you seen or experienced?

“Unprecedented improvement in APU program health” was one interviewee’s response. Compared to the traditional support approach, the PBL effort has already saved millions of dollars. The team philosophy as PBL was implemented was to break even or better, even though cost may not always be the most important element of PBL. One interviewee reported that there were critics who focused entirely on cost and were quick to accuse the IPT of “buying too much performance”. The interviewees felt that this PBL program has proven that with increased reliability and performance, cost benefits will naturally be realized over a period of time.

Another post implementation result reported by one interviewee is that the Supply Chain Solutions Office has initiated a Lean Six Sigma effort intended to reduce the time required for PBL implementation.

4. F404 Engines

Interview questions were sent to six individuals identified as members of the F404 PBL implementation IPT. Four responses were received (one from upper management level, two from middle management level, and one from the functional level.) One member was not involved in the beginning of the program, but came on board to replace an exiting member after the PBL contract was awarded. The other three interviewees were involved during the PBL IPT start up. The functions represented by the

interviewees include program manager, logistics, and contracting. Follow-up interviews were conducted by telephone.

Question 1: How is your organization structured?

Although the descriptions of the organization varied slightly, the interviewees all stated that the NAVICP organization utilizes an IPT structure (and has done so for approximately 10 years), with each team supporting an airframe or platform. Because the engine crosses various platforms, the engine IPT exists at the component level. The engine IPT has four branches. They consist of two branches for engine component support, one branch for technical support, and a Whole Engine Management Branch. The logistics and procurement IPT members are co-located. Personnel serve simultaneously on multiple IPTs.

The engine IPT became the PBL implementation IPT when they were assigned the task of implementing PBL on the program. The task assignment came from NAVICP upper management. The IPT members necessary for daily activities and execution were considered core members. Logistics and contracting personnel were specifically identified as core members. Other IPT members including customers, a policy group called “Supply Chain Solutions”, Quality Assurance, Engineering, General Electric (the contractor), Defense Logistics Agency (DLA), and the Project Manager (PM) were considered part of the team, but met with the core members on a bi-weekly or monthly basis depending on the need.

Two of the interviewees identified themselves as the IPT lead. Further information provided from each party led us to believe that the IPT was actually led by an individual acting in a program manager role. The other interviewee took the lead in the contractual execution, including preparation of pre and post negotiation memorandums, as well as the negotiation itself.

The Product Support Integrator (PSI) was difficult to identify. Two interviewees could not identify the PSI. Another interviewee stated that the entire IPT acted as the PSI and the last interviewee stated that the Navy had PMs for planes at different locations, but the Navy Supply Command (NAVSUP) was able to make decisions independent of them.

Question 2: How did your structure change as PBL was implemented (or did it)?

The interviewees stated that change in the structure during implementation was minimal. The IPT did become smaller or “leaner” with the elapse of time. The PBL implementation IPTs were much larger in number in the beginning (to “kick-off” the program), because they included all stakeholders. Once the PBL strategy and acquisition planning was finished, the core members took over the actual execution, effectively reducing the group to approximately twelve members. The interviewees all responded that the core version of the IPT was still intact but they meet less frequently as time goes by.

During the follow-on interviews, the interviewees were asked who prepared the Business Case Analysis (BCA)? The responses varied, however, it was clear that the IPT did not prepare the BCA. One interviewee stated that a product and engineering group prepared the BCA with active participation from the IPT. Another interviewee stated that the BCA was executed by the Comptroller. Still another stated that the BCA was prepared by the Supply Chain Solutions group. In spite of the difference in responses as to who prepared the document, all interviewees indicated that the IPT members participated by providing information during preparation, and that they were aware of the BCA contents. When asked if the BCA addressed alternative strategies (other than the one selected) as PBL guides suggest, the interviewees stated that it did not. (One IPT member stated that the PBL guide was a “preachy document” that suggested PBL be considered, but didn’t explain the implementation process.) They stated that, in lieu of alternatives, the BCA only documented a comparison between the “status quo” and the selected strategy.

The interviewees were asked if the IPT received any informal or formal PBL training. They were all aware that the Supply Chain Solutions Group (support staff office) offered a kick off session, however the information obtained during the interviews was inconclusive as to whether the F404 IPT had ever completed this session. Other responses offered were that personnel are more experienced in PBL techniques now

because they have been using them for several years, and that AT&L workforce certification requirements now include PBL training so additional training is no longer needed.

Question 3: What organizational design elements had a positive or negative impact on PBL implementation?

Two interviewees responded that the pre-existing IPT organization allowed the effort to progress at a faster pace because members already understood each other's roles. One interviewee discussed specifically the mutual understanding of duties and limitations between procurement and logistics IPT members. During the follow-on interviews, these IPT members were asked if the Supply Chain Solution Group (responsible for kick-off training and perhaps some of the BCA preparation) had a positive or negative impact on implementation. Both members stated that they did not think Supply Chain Solutions had any effect on the success.

Another interviewee stated that the support of the weapons manager was critical to successful implementation. He indicated that when weapons manager support was apparent, PBL implementation proceeded at a faster pace.

Personnel resistance to the PBL concept had some negative impact at the beginning of the program. Two interviewees responded that the general lack of information about PBL was likely a source of fear amongst some of the IPT members. They continued on to say that initially there was concern about displacement, especially in the depot and within DLA. The concerns were that DLA parts would become Contractor Furnished Material (CFM) leaving the DLA logistics personnel with nothing to manage! The depot personnel were concerned that PBL would eliminate organic support (their jobs) at the depot. They both stated that the fear seemed to dissipate with time and that all members of the IPT seemed satisfied with the PBL arrangement once it was in place.

Question 4: If you could go back and change anything during the implementation phase, what would it be and why?

Two interviewees responded that if they could change anything, they would have narrowed the focus more quickly. Specifically, they mentioned that at the beginning, the PBL strategy included DLA and they wished they had focused on NAVICP items only. In fact, the DLA portion was eliminated months later because that portion of the scope was prohibiting progress on the NAVICP portion. One of the interviewees stated that he believed follow-on PBL for the program would include DLA, but a narrow focus during start up was most effective.

Another interviewee responded that during the start of the PBL contract, there was a “disconnect” when it became apparent that not all parties were working to the same Scope of Work. He stated that the problem was resolved quickly, but did cause some initial confusion.

The last interviewee identified several elements factoring into the success of the PBL effort. They were: (1) a good working relationship within the IPT, and between the IPT and the contractor; (2) a willingness by the Navy and contractor to compromise during negotiations; and (3) an accurate calculation of demand for 36 components covered under the PBL (baseline data). During the follow-on interview, he also stated that another contributing factor was upper management support. This interviewee identified funding as a challenge to success but could not elaborate on specific funding issues.

Question 5: What post-PBL implementation results have you seen or experienced?

All interviewees identified results as a decrease in backorders (from over 800+ to nearly 0), an increase in component life, and monetary savings. One individual also added that work-in-progress and repair turn-around-times had been reduced.

C. GAO REPORT

GAO Report 05-966, DoD Needs to Demonstrate that Performance-Based Logistics Contracts are Achieving Expected Benefits, was published in September 2005.

The report stated that the Services were not conducting updates to BCAs and that savings as a result of PBL implementation could not be proven. All IPT members were asked if they were aware of the GAO report. All interviewees reported being aware of the report and its contents. They all responded that the Department of the Navy did not concur with the GAO's findings but other responses were inconsistent. Some indicated that they (IPTs) do, in fact, provide updates to BCAs when required (e.g. changes in scope). The Radar Warning Receiver IPT was specifically asked if they had updated the BCA prior to award of the 5-year option period on the PBL contract. They responded that they did not, although they did review the document to make sure the numbers were still valid. They also added that they did not believe the GAO staff really understood the PBL concept and because of its complexity, it would be hard to relay a solid understanding to the GAO staff. One member from the F404 IPT stated that the BCAs were required only for budget purposes (to estimate future funding needs.) He added that there is no point in re-thinking the PBL strategy under a firm fixed price contract. Another F404 IPT member stated that he was not sure if the BCAs were updated because the Supply Chain Solutions office was responsible for that document.

D. INTERVIEW RESULTS – SATS IPT

Interview questions were sent to five IPT members on the Army's SATS team. One member was at the middle management level, the other four were at the functional level. The SATS team is in the process of implementing PBL. Their responses are combined and provide a general consensus of how the IPT team is structured, how it operates, and their perceptions of PBL.

Question 1: How is your organization structured?

The TACOM organization has utilized an IPT structure since 1997. The SATS IPT was formed in 2001, prior to the Milestone Decision Authority/Approval. The IPT consists of personnel from contracting, logistics, item management, engineering, quality assurance, pricing, legal counsel, policy, combat development, and the production contractor. The SATS is currently supported using the traditional Army supply system. The SATS was not identified as a PBL candidate when the initial production contract was awarded, but became a candidate in mid-2004.

Question 2: How do you feel about PBL?

Most interviewees have only a limited knowledge of PBL. They feel that the Army guidance is lacking and they are unsure how the SATS program, as it currently exists, would implement PBL. They do know that PBL was designed for application to Acquisition Category (ACAT) I and II Programs. Since the SATS is an ACAT III Program, they are not sure if PBL could or should be implemented. The Project Manager for the past two years was a proponent of PBL. Team members state that they are uncertain where the new leadership staff stands on this issue.

Question 3: What significant changes has your organization experienced in the past five years, and how were they received?

The major change mentioned was that operations are different since the start of the war. The priorities have shifted to a total soldier support mindset. Prior to the war on terrorism, people were focused more heavily on satisfying the requirements generators, even though they always knew the soldier was the ultimate customer. That focus has shifted to a more direct communication with the soldier in some instances.

The restructure to a modularity concept has also increased the visibility of the Product Manager at TACOM Rock Island. This has resulted in continuous program reviews where tool sets and kits are being combined to accommodate the future force structure.

Question 4: How do you feel about contracting for performance when the support strategy has traditionally been organic?

One IPT member stated that if the strategy works, the SATS IPT should use it. Information received from other IPT members indicated that they were not familiar enough with the PBL concept to identify changes that implementation would cause and therefore they could provide no definitive response.

E. APPLICATION TO THE ORGANIZATIONAL DESIGN FACTORS

1. People

All four PBL IPT organizations studied contain a diverse blend of individuals from different backgrounds with various levels of education and experience. The

individuals interviewed from the PBL teams were upper management, middle management, and functional program members.

a. Familiarity with Teaming

All of the PBL team members responded during the interviews that they were already familiar with the IPT environment (but not necessarily familiar with PBL), before being assigned to the PBL teams, so they had a better general understanding of the roles and duties of each member. They felt that this continuity in structure allowed them to work together as a cohesive unit, and progress at a faster pace. The IPT members felt that they had the authority to make decisions, as long as they were within the guidance issued by the Navy.

b. Communication

One team reported that one of the biggest challenges during implementation was communication and that many issues could have been avoided by making sure that all levels of management and necessary players were kept informed, and that the information provided was specific and timely.

c. Reward Systems

The interviewees provided information that indicated there were informal and formal reward systems in place. Formal awards were in the form of monetary compensation for team and/or individual performance. Concerning the informal reward system, several interviewees indicated that participation on the PBL team afforded promotion potential.

d. Fear

Nearly all of the IPT members reported that there was some initial fear and reluctance amongst the teams and stakeholders because the concept of PBL was new to them, and because they could be “contracting themselves out of a job.” The most noticeable example provided was by the APU team member, who stated that depot personnel balked when they realized that the PBL provider staff would assume some of their functions. The depot staff initially viewed the PBL effort as a threat to their existence, but later recognized that implementation of PBL would allow them to return to their core function of “turning wrenches.” The Defense Logistics Agency (DLA) was another example. They were afraid that if parts management became a contractor’s

responsibility, they would have nothing to manage. None of the IPT members reported that personnel displacements actually occurred as a result of PBL implementation, and two stated that implementation actually turned out to be an effective method in dealing with reduced human resources. Several interviewees stated that the personnel in the NAVICP organization have, in general, become more receptive to the PBL concept as their level of experience has increased and the guidance has become more available.

e. Upper Management Support

IPT members from two teams reported that upper management support was strong and that it was a key element as the teams worked through the initial confusion and lack of enthusiasm. Other IPT members identified individual personalities of IPT members as having contributed to success, because the teams included high-level members who were motivated, dedicated, cooperative, and strong-willed.

f. Multiple Assignments

Interviewees reported that assignments to the PBL implementation teams came from upper management and that, in many cases the assignment was in addition to their existing duties. They were expected to fulfill the assignments from both jobs simultaneously. One person who was assigned multiple tasks indicated that the PBL effort took precedence, causing his other job duties to suffer. The F/A-18 E/F team members reported that they also were assigned to the PBL effort in addition to existing duties and that they initially met off-site to minimize distractions.

2. Processes

a. Training

When asked about training, the IPT member's responses indicated that training was minimal. The RWS IPT members said they received a short "kickoff" training session and possibly some other training when the team was formed. They stated that it was conducted by the Supply Chain Solutions Office. The F/A-18 E/F team members indicated they had received no training, and the information regarding training obtained from the F404 team was inconclusive. Other individuals offered that personnel are more experienced in PBL techniques now because they have been using PBLs for several years and that most logisticians and program managers have completed the

AT&L workforce certification requirements, including two logistics classes that focus primarily on PBL. They state that additional training is no longer necessary.

b. Loss of Productivity and Fear of the Unknown

Each IPT team felt they experienced an initial loss of productivity while the team worked the “bugs” out. Since many of the team members were unfamiliar with PBL and were given little or no introductory training, the team spent valuable time figuring out the schematics of what they were suppose to be accomplishing. With that came the fears that they might be going down the wrong path.

c. BCA Documentation

One specific area in the PBL process that was discussed at great length was the preparation of BCAs. None of the IPT members that were interviewed reported that the BCAs were prepared by the IPT, although most indicated that they were aware of the BCA contents. Responses about who actually prepared the BCA varied between teams and included the Supply Chain Solutions Office, the Comptroller, a production and engineering support office, and a group called the “price fighters.” Responses about the contents of the BCAs were, however, consistent between teams. Interviewees were asked whether the BCA contained alternative strategies or documented that alternative strategies had been considered. They responded consistently that the BCA contained only the PBL strategy that was selected with a comparison to the “status quo.” If there was formal guidance issued by the Navy for preparation of BCAs, it was not mentioned by any interviewee.

d. Assignment of IPT Leader and PSI

IPT members were asked about the process of assigning an IPT leader or Product Support Integrator (PSI.) Many interviewees were unfamiliar with the term PSI. Several stated that they thought the Navy might use a different term for this function but none identified that term. No one mentioned an informal or formal process used for PSI assignment. One F/A-18 E/F IPT member did identify the program manager as the PSI. The position of IPT leader was assumed by various team members. The lead was not assigned to the same functional category on each team.

3. Structure

a. Cross Functional Teams

Each of the four PBL programs operated under the same overall organization of NAVSUP, Naval Inventory Control Point. For the purpose of implementing PBL, all four of the organizations chose to use an integrated team structure, where multiple functions were represented. The IPTs consisted of larger numbers of personnel when they were initially formed, and then were reduced to a core group of about 10-12 people. Core members included logistics and contracting personnel for every team. Other IPT members from specialized functional areas were called to participate on an as-needed basis or to attend subject-specific meetings. This occurred naturally (unintentionally) in the process for two teams, and the teams were intentionally pared down for the other two programs. The IPT members stated that the core group was more productive and operated more efficiently than the larger group because there were less conflicting priorities. The F/A-18 E/F IPT structure also included an Executive Steering Committee made up of the highest-level team members responsible for tracking and ensuring progress as well as forming strategy. The team leaders were then responsible for action items and due dates assigned to sub teams. The IPT members who were interviewed stated that this accountability proved to be invaluable to the team's success. Other than streamlining the initial IPTs, there were no other significant changes in the structure of any of the teams/organizations over the implementation period.

The IPTs were created solely for the PBL efforts, however, the team personnel were accustomed to operating in an IPT environment prior to being assigned on the PBL implementation teams because NAVICP had been using this structure for about 10 years. In many instances, the personnel had already been assigned to the weapon system team for the same system that was implementing PBL, thus the assignment to the PBL team seemed natural. Many IPT members retained their original job duties in addition to the duties related to the PBL effort. All of the IPT teams are still intact, at least at the core group level, years after the initial implementation.

b. Support Offices

All of the IPTs used support offices to some extent. Specifically mentioned was the Supply Chain Solutions Office. Although information varied from team to team, it is clear that this support office had a role in the preparation of the BCA, and some informal PBL training. Other staff support offices mentioned in conjunction with BCA preparation were the Comptrollers Office, and the Production and Engineering Support Office.

c. Assignment of PBL Team Leaders/PSIs

The IPT leader role was not formally assigned and it was not assumed by the same function (i.e. contracting, logistics, program manager) on each IPT. Several IPT members responded that they did not know who lead the IPT, although one interviewee indicated that the weapon manager support was critical to successful implementation of PBL. That team member added that when weapon manager support was apparent, PBL implementation proceeded at a faster pace. There was similar confusion about the PSI. Most IPT member responses indicated that they did not know who was assigned as the PSI, indicating there was no formal assignment.

F. SUMMARY

This chapter described the results of interviews of IPT members from four programs that have implemented PBL and the SATS program, which is in the process of implementation. The results were grouped first by program, and then by the organizational design factors of people, processes, and structure. The next chapter will describe conclusions and recommendations for organizational design factors having a bearing on successful implementation of PBL.

THIS PAGE INTENTIONALLY LEFT BLANK

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. INTRODUCTION

The purpose of this study was to describe and analyze the organizational design factors that may have benefited or hindered PBL implementation. This paper focused on the specific areas and design factors of people, processes, and structure. Using the information obtained from the interviews with PBL IPT members, the study identified additional organizational characteristics that appeared to have a direct impact on implementation of the four Navy PBL programs. Recommendations for implementation and application to the SATS Program have been generated based on those characteristics, and a template has been formed to facilitate the use of PBL. The review and analysis of the information collected is designed to advance the understanding of PBL and the effects of organizational design factors on the implementation of PBL.

This chapter contains an analysis of the findings presented in chapter 4. This analysis uses the Organizational Systems Framework to identify design factors of the four Navy programs that have implemented successful PBL programs. By identifying and analyzing the design factors that contributed to the success of the PBL programs, we have been able to draw conclusions concerning certain design factors that had a direct impact on organizational performance. These conclusions will advance the understanding of organizational congruence and design. This chapter also includes recommendations and a template designed to facilitate PBL decision-making and application of PBL to the SATS Program and other potential TACOM programs.

B. ANALYSIS OF FINDINGS AND CONCLUSIONS

The people, processes, and organizational structures examined appeared to play a substantial role in the implementation process shifting each of four Navy organizations from a traditional transaction-based approach to a performance-based approach in the area of weapons system support.

1. People

a. Familiarity with Teaming

We found relatively consistent commonality in terms of the expectations and performance capabilities of the IPT members both among and between teams. All of the members on the four PBL IPTs had worked in an IPT environment prior to the PBL assignment. They all indicated a basic understanding of each other's roles and responsibilities and acknowledged the importance of integrating those roles to achieve common goals. This familiarity with a team-based structure made the transition to a PBL team faster, easier and more comfortable for team members. The continuity of the teaming environment gave PBL IPT members something familiar to rely on as they ventured down a relatively different assignment. (One individual commented that "persistent personalities" of team members had a significant impact on success.) TACOM-RI personnel are also familiar with cross-functional teams. The organization has been using an IPT structure for approximately eight years. Continuing to use a cross-functional IPT for PBL implementation could facilitate a cohesive and stable team relationship. Conversely, using an alternate coordinating mechanism (other than a cross functional IPT) could cause additional confusion and time delays due to PBL participants having to learn new roles, establish new relationships, and develop adaptive working processes.

b. Communication

One team clearly indicated that communication was a challenge and that in some cases issues could have been avoided if more specific and timely information had been provided. The biggest communication challenge seemed to exist outside of the team, i.e., managing external boundaries. When channeling information upward or outward, IPT members indicated facing relatively numerous obstacles and various forms of resistance. Although it was only specifically mentioned by one team, all teams generally acknowledged that effective communication would be a challenge, inherent with the introduction of a new business process and formation of a new team that could not be avoided. However, recognition of the challenge during the beginning of the program was critical to establishment of a proper and efficient knowledge sharing and communication path. Familiarity with teaming seemed to facilitate identification of key

stakeholders within and outside of the organization, ensuring that communication paths would be more effective. Stressing focused and clear communications, the teams indicated they were able to avoid many internal issues that could have been disruptive.

c. Reward Systems

Information obtained during the interviews showed that the PBL IPTs had both formal and informal reward systems, however the interviewees appeared to place the informal rewards in a higher regard. Individuals seemed to possess a real dedication and desire to work toward successful implementation of the PBL program and established goals. The interviewees also indicated that they felt their promotion potential increased after working on a PBL implementation team. The team members used words like “felt appreciated” and “felt essential”, perhaps in part because they indicated they received continuous praise for their efforts. Monetary (formal) rewards were mentioned and were said to be sufficient.

TACOM has not completed implementation of PBL into any program. We believe that some of the SATS team members (and other TACOM associates as well) are skeptical of upper management support, because implementation is being mandated instead of encouraged. Some officials demonstrate a lack of concern as to whether PBL is actually an appropriate strategy for implementation. For example, as stated in a previous chapter, PBL is mandated for ACAT I and II programs which are the more complex, higher dollar value programs. The SATS Program, and a high percentage of other TACOM-RI programs are ACAT III (higher in density, lower in dollar value and complexity) where PBL may not be appropriate, but still, some higher-level officials demand that TACOM-RI nominate candidates for PBL implementation.

d. Fear

All interviewees indicated that there was some level of fear amongst the IPT members and organization when the PBL implementation effort was assigned. The concept of PBL can have a negative connotation because of the potential for government jobs to be contracted to the private sector. Many team members and personnel from other areas of the organization felt threatened. That threat diminished as PBL was implemented and no actual displacements occurred. Of course, many duties were shifted,

which had the positive effect of allowing team members to gain different types of experience. Also, fear has slowly dissipated as personnel have become accustomed to this new business practice.

The SATS IPT members did not indicate that fear of contracting out government jobs affected their team at all. Based on the information provided in response to the interview questions, it appeared that the SATS team might not fully understand the PBL concept and implications of implementation. This will be explored further later in the chapter as part of processes and training.

e. Upper Management Support

We largely attributed the level of dedication and commitment the IPTs showed toward establishing PBL goals to the tremendous amount of upper management support provided at NAVICP. The IPT members truly believed in the upper management support and did not seem at all skeptical that PBL was simply a fad or another feather in someone's cap!

f. Multiple Assignments

Assignments to PBL teams came from upper management. When management decided to assign skilled associates to the PBL efforts, they forgot one thing: people were already engaged in pre-existing program issues. Since PBL was identified as a top priority, the existing programs received less attention and some began to suffer. Although there is not enough information to determine whether multiple assignments were appropriate or not, the interviewees indicated that it was problematic. To avoid conflicting priorities and added stress, leaders would need to carefully examine their expectations to determine whether they are realistic, and plan accordingly. "People," including the aspect of human burnout, are part of organizational design. When people are assigned new work, the extent to which there is a concomitant decrease in existing workload would appear to directly impact productivity. When one of these parts is misaligned, the system will experience inefficiencies (Roberts, 2000).

2. Processes

a. Training

Interviewees indicated that some level of training was available within each of the organizations, although the training that was actually conducted was minimal and inconsistent from team to team. Other than the short “kickoff” training that one team attended, many had little or no PBL training as an implementation team. Most of the logistics specialists have begun to work their way through the Acquisition, Technology and Logistics (AT&L) certification process that includes completion of two Defense Acquisition University (DAU) logistics courses that focus primarily on PBL, but this training is very broad and is completed individually. In addition, many IPT members interviewed are now so experienced after having worked PBL efforts for a number of years, they no longer acknowledge the lack of training as a problem. We saw a number of problems that could be traced back to inadequate training.

b. Loss of Productivity and Fear of the Unknown

Productivity was definitely lost as IPT members spent time struggling with the unknowns of the new PBL concept. Assignment to the PBL IPT was an unfamiliar and overwhelming responsibility for team members, especially those who were still required to perform pre-existing duties. “This ‘total immersion’ process creates a great deal of stress on new personnel whose goal often shifts from mastering the job to learning ‘survival techniques.’” (Bruner, 1998) As with any new process, it is expected that people will fear what they do not know or understand. Informative and timely PBL training could alleviate the fear that employees might be contracting themselves out of a job.

c. Business Case Analysis (BCA) Documentation

IPT members seemed unfamiliar with BCA documentation. Although all IPT members said they were familiar with the contents of the BCA prepared for their program, the responses about who prepared the documents were inconsistent even among team members. We also found that their descriptions of BCA contents were inconsistent with DoD guidance. DoD guides state that BCAs should document all alternatives of PBL strategy. Without exception, the IPT members who were interviewed stated that BCAs prepared at NAVICP included only a comparison between a traditional support

strategy and the selected PBL strategy, and that the BCA was not used to help the team decide on which strategy would be optimal.

d. Assignment of IPT Leader and PSI

There was no mention of a formal process for assigning an IPT Leader or a Product Support Integrator. On each of the four Navy programs, there was one or more team members that did not know who was assigned to lead the IPT or who was assigned as PSI. Many interviewees stated that they were unfamiliar with the term PSI, but even after they were provided a description of that role, they could not identify a person occupying the position.

Proper training is essential, especially with the introduction of a new business process as complex as PBL. These programs are complex, high visibility, high dollar, ACAT I and II Programs that demand the best available resources. In order to benefit from those resources (people), proper (meaningful and high quality) training must occur.

Proper and timely training has many benefits. Given proper training, the teams would consistently know how to select or assign an IPT leader and a PSI. They would know who prepared the BCAs, what the BCAs were used for, what they contained, and when they should be updated. Another benefit of training is a broader understanding and knowledge of PBL.

The SATS IPT members have not completed any PBL training as a team, which explains some of the confusion and fear they are experiencing as they seek to implement this new business process. They did, however, assign an IPT leader when the team was first established. None of the IPT members, including the leader, had any experience with PBL prior to the assignment. Training as a team would allow them to become familiar with terms, processes, and what to expect upon implementation.

e. Guidance

The findings in the September 2005 GAO report provided some interesting insight into the Navy's implementation of PBL. DoD guidance provides a skeletal framework for implementing a PBL strategy; however, the Navy has established their own version. While the Navy guide may resemble DoD's to a degree, there are

some subtle interpretation differences. For example, the GAO report alleged that BCAs are not being updated as they should. Information obtained during the interview process indicated that the Navy uses their own PBL guidance that provides a different interpretation as to when updates are required. Establishing supplemental guidance within the Military Services is not unusual, but Services should ensure that it is consistent with DoD Directives and guidance.

3. Structure

a. Cross Functional Teams

The IPT members of the four organizations studied worked in IPT environments prior to being assigned implementation of PBL. The IPTs were established to support weapons or aircraft systems. IPT members were therefore familiar with the teaming concept and also with the items/systems for their particular team. During initial formation, all stakeholders were included on the team. This included cross-functional members such as program managers, weapon system managers, contracting, logistics, quality, and engineering. It also included others with a vested interest such as the contractor, the depots, and customers or users.

Shortly after the PBL IPTs were established, team members realized that the teams were too large to work effectively and restructured by transitioning from a large group to a smaller group. This was a streamlining effort designed to enhance productivity by empowering a smaller group of core members. The IPT members stated that the core group was more productive and operated more efficiently than the larger group because there were less conflicting priorities. One of the PBL teams used an Executive Steering Committee to track progress and assign accountability to sub-teams. The team members seemed entirely satisfied with the results, stating that the accountability proved invaluable. The PBL IPTs remained intact past the date of this document.

We conclude that the use of an IPT structure for PBL implementation was a factor conducive to success, primarily because each team member was familiar with the concept and could operate efficiently and effectively immediately when the team was formed. If the programs were setup in a traditional functional or stovepipe structure – a

structure no longer familiar to many NAVICP personnel – communication problems would have likely resulted in confusion, greater inefficiencies, and untimely actions.

b. Support Offices

IPT members mentioned a variety of support offices that played an integral part in the PBL implementation process. For example, a group called the Supply Chain Solutions Office was one support office that conducted training, prepared BCAs, and prepared or provided PBL implementation guidance. We were unable to define the exact mission of the Supply Chain Solutions Office with the information obtained during the interview process, however it was apparent that one of their main functions was to prepare BCAs for any PBL IPT in NAVICP. For each PBL effort, they were available to prepare, coordinate, and staff the BCA, although not all of the IPTs used the Supply Chain Solutions Office for this task. One advantage to using a single office to prepare BCAs is that this alleviates the need to research the method and contents required for a BCA each time one needs to be processed. It also ensures a degree of consistency in the final product. A disadvantage to using a support office to prepare the BCA is that some team members did not appear to know specifically what the BCA contained. One reason may be that the Supply Chain Solutions Office coordinates at a higher level and not with the IPT.

According to the interviews, the Supply Chain Solutions Office also provided some form of kickoff training to some of the teams. As discussed earlier in this chapter, we see a real benefit to receiving proper and timely training. If the Supply Chain Solutions Office or another support office was assigned responsibility for providing PBL kickoff training, they could ensure that all pertinent process and procedural information was consistent and was presented immediately after formation of the PBL IPT.

c. Assignment of PBL Team Leaders

Even though the structure of the organization seems to fit the overall purpose, there are critical misalignments in some areas. There is no formal assignment of IPT leaders. Additionally, when the IPT leader naturally emerged, they did not always represent the same function on the team. For example, the weapon system manager did not always emerge as the team leader. This is a structural mistake because it causes

internal confusion when IPT members do not know who their assigned PBL IPT leader is. Even though functional team members are aware of each other's responsibilities and duties, a formal IPT leader should always be clearly identified.

The SATS IPT immediately identified an IPT leader when the team was formed. The IPT leader has been instrumental in guiding the team through the beginning steps of an unfamiliar process.

d. Assignment of PSI

A similar problem exists with the PSI. The PSI plays a key role in the agreement between major stakeholders, and especially the Program Manager. He has an important role in integrating the PBL effort and is the single point of accountability that makes sure industry and the government work together to meet performance objectives. The PSI can be a government or private industry representative. Even though the PSI role carries the utmost responsibility, most of the team members interviewed were not familiar with the term PSI. They may have used a different name for the function, but even after being given a definition of the PSI function, they were unable to identify who was assigned this role. This is another area where a formal assignment would ensure that all team members were aware of who the person was and what function they performed.

C. RECOMMENDATIONS AND APPLICATION FOR THE SATS AND OTHER TACOM-RI PROGRAMS

Identifying and developing lessons learned is an important step in implementing change. The scope of this study was to identify organizational design factors that may have contributed to effective and ineffective levels of performance. A comprehensive analysis of the data collected provides this information.

1. Current Status of SATS

The SATS Program was identified as a PBL candidate well over a year ago (mid 2004). PEO guidance was issued at that time and provided a 13-step process for implementing PBL. The intent of the PEO guidance is to complement DoD's guidance. The PEO guidance consists of similar steps (but not identical and not necessarily in the same order) as the DoD guidance outlined in Chapter II. The SATS Program is currently at Step 5, which involves base lining the system. The SATS IPT is struggling through the base-lining step because it is a new system and historical information that would be used

for a baseline is not available. Thus far, the results of this step have been inconclusive in determining whether the SATS Program should cease or move forward with PBL.

2. Careful Consideration for ACAT III Programs

Based on the extensive effort, resources, and “total immersion” that have taken place attempting to make PBL a good fit for the SATS system, we recommend that all future ACAT III programs be more carefully scrutinized prior to commencing the initial steps of implementation procedures. DoD mandates consideration of PBL for ACAT I and II systems. When initial direction to implement PBL was provided to the SATS team, concerns were raised about its applicability to this ACAT III Program. SATS is not categorized as an ACAT I or II system because it is not considered to be a highly complex system (it consists of commercially available automotive tools), it is not high visibility/high dollar (total unit price is less than \$250,000), and it has a high density in the field (current POM quantity is approximately 6000). Although SATS is a mission critical system used to provide maintenance support for Army combat and tactical equipment on the battlefield, it does not directly affect combat readiness. In addition to the fact it is an ACAT III system, there is no maintenance program to capture reliability data, there is no depot repair program in existence, and sustainment costs are low. These are a few of the criteria that should be considered before ACAT III programs are nominated as PBL candidates. Input from subject matter experts should be carefully considered because they possess an intimate knowledge of their system(s).

3. People

a. Use Highly Skilled IPTs

IPT interviewees reported that personalities of individual team members played an important part in implementation progress. Specifically, they mentioned strength and persistence.

We recommend that prior to the formation of a PBL IPT, an analysis of the organization and potential team members be completed. The goal of this analysis should be to gather enough information in order to choose a team consisting of highly skilled leadership and specialists who possess the necessary knowledge, skills, and abilities to form a congruent relationship and carry out the mission successfully. Team

member selection should not be based on availability. Instead, they should be “hand picked” in order to give the program the best chance for success. We recommend that the analysis above be completed for the SATS team (already selected) and if skill gaps are identified, alternate members should be selected.

b. Establish Roadmaps for Communication

All IPTs studied agreed that communication was a challenge that could not be avoided.

We recommend for SATS and other TACOM-RI programs, that communication paths and chains be established and agreed upon by the initial IPT, and that those paths be formally documented. The formal documentation should identify key stakeholders as well as information flow. This will ensure that the entire team understands how and what information will be provided. It also provides a roadmap that can be used for conflict resolution.

c. Identify Reward Systems

The interviewees from the IPTs studied were successful using both informal and formal reward systems, although they seemed to favor the informal reward system. We attributed that, in part, to the tremendous upper management support.

We are concerned that the described type of upper management support at NAVICP does not exist at TACOM. We recommend that TACOM leaders become more knowledgeable about PBL so that they can sincerely demonstrate their support of this new concept. Sincere demonstration requires that leaders recognize that PBL may not be appropriate for all programs and cannot be applied across the board. Thus, they must be ready to accept (with a proper analysis) an IPT’s determination that their program is not a good PBL candidate. One method to increase leader’s PBL savvy is to create short modules for knowledge enhancement. We suggest a support office, such as the strategic planning team, provide these modules.

We recommend that upper level managers further demonstrate their support of PBL by informing the IPTs during formation of any potential formal or informal awards that may be available upon successful implementation. Additionally,

upper level managers must publicly acknowledge that the IPT has an important and highly visible task to perform. These actions will create team buy-in to the PBL effort.

d. Remove/Prioritize Conflicting Impediments

Upper managers assigned personnel to PBL IPTs. In most cases, these personnel were also required to perform pre-existing duties, as well as new duties related to the PBL effort. Conflicting priorities caused confusion and stress, as well as degradation in performance on pre-existing duties.

Some of the SATS IPT members are also members of other IPTs. Conflicting priorities may have delayed implementation progress. We recommend that upper managers clearly identify the priority of the PBL effort during team formation and ask the team to identify other tasks that may impact their work on the program. Managers should be responsible for removing any roadblocks to progress or success.

4. Processes

a. Provide Consistent Training and Guidance

Interviewees indicated that some level of training was available within each of the organizations, although the training that was actually conducted was minimal and inconsistent from team to team. The numerous problems associated with lack of training were explained earlier in this chapter.

We recommend that TACOM task a support office with development of a PBL “kick off” training and that it be conducted for every TACOM-RI IPT seeking to implement PBL. The training should give an overview of the PBL concept and explanation of the implementation process. A portion of the overview and explanation should be devoted to potential implications (negative and positive) of the application and real life examples. Finally, the support office should provide a listing and location of available guidance. The timely and consistent application of a kick off training session would help to reduce initial fear (of the unknown) and negativity, familiarize the IPT with PBL terms and procedures, and provide them with the references they will need to guide them. Although the SATS team is past the initial IPT formation and is further along in the process, we recommend that this IPT be given PBL team training to facilitate completion of the process and confirm that they are headed in the right direction.

5. Structure

a. Use IPTs

The successful PBL programs studied all used an IPT structure with representation from various functions. This structure was optimal because personnel were already familiar with it. They understood how an IPT worked and the roles and responsibilities of team members. The initial membership of the IPTs was large because it included all stakeholders. Sometime shortly after formation, the IPT was reduced to a core group, usually 10-12 people.

We recommend that TACOM programs considering PBL be structured as Integrated Product Teams with representation from any applicable function. The TACOM organization has been using an IPT structure for at least 8 years, thus TACOM personnel are already familiar with the teaming concept and the roles and responsibilities of IPT members. The SATS program is already organized as an IPT.

We also recommend that all stakeholders be part of the IPT that is initially formed, but that sometime during the first six months the IPT be reduced to a core group, or that a sub-IPT of core group members be formed. This core group should consist of 10-12 people that are involved in the daily execution activities. The larger (or complete) IPT should continue to meet periodically to monitor progress and have input to strategic decisions. The larger IPT may want to consider appointing an Executive Steering Committee to do this, as it would reduce the number of meetings required for the larger group. The SATS team has naturally reduced itself to a core group for daily execution activities.

b. Use Support Offices

The IPTs that were studied used support offices to provide training and to prepare BCAs. There were advantages and disadvantages associated with this. One advantage was the gain in efficiency because the personnel preparing the documents were already familiar with content and format requirements. Another advantage was that the BCAs and training were consistent in format and content for all programs. A significant disadvantage was that because they were not involved in the preparation, the IPT members disassociated themselves from it and were not always aware of BCA contents.

We recommend that TACOM use a support office for BCA preparation, and that those personnel involved in the BCA preparation be temporarily matrixed to the IPT. This structure allows the gain in efficiency, at the same time ensuring that team members are still connected to the document and information it contains. The TACOM-RI organization already includes a Strategic Planning Team, and we suggest that team be an option for this assignment.

c. Formal Assignment of PBL IPT Leaders

The PBL IPTs that were studied did not have a formal assignment process for IPT leader. We believe this caused some internal confusion within the team.

The SATS team did assign an IPT leader when the team was formed and all members are aware of who took this role. For other TACOM-RI IPTs, we recommend that an IPT leader be assigned at formation, and that the assignment be documented. The assignment documentation should be updated if the leader changes. This formal assignment not only establishes a historical record for administrative purposes, but also ensures that all team members recognized the person in a leadership position.

d. Formal Assignment of the PSI

The PBL IPTs that were studied did not have a formal assignment process for the Product Support Integrator. The PSI is a very important position with the responsibility for integrating the PBL effort. Most of the team members were not familiar with the term PSI, and did not know who was assigned this role.

The SATS team has not progressed far enough in the implementation process for PSI assignment. For SATS and other TACOM-RI IPTs, we recommend that a PSI be assigned formally (in writing) at the proper time in the implementation process. The assignment documentation should be updated if personnel changes affect the assignment. This formal assignment not only establishes a historical record for administrative purposes, but also ensures that all team members recognized the person responsible for integration so that they can report progress and significant issues.

D. TEMPLATE FOR PBL DECISION MAKING/IMPLEMENTATION

All of the recommendations contained in this chapter have been incorporated into a template shown as the Appendix. The template is designed to facilitate PBL decision-making and application of PBL to the SATS Program and other potential TACOM programs. The template will be provided to TACOM-RI leaders and recommended for use across the organization.

E. AREAS FOR FURTHER RESEARCH

Due to the complex and dynamic nature of PBL, limitations had to be placed on the depth of research we could realistically perform. Many topics were mentioned in the interviews that deserved further investigation. We did not pursue those topics; however, they are presented below as areas for further research.

1. Develop a Measurement Method

A measurement method that fits the PBL system is recommended. PBL reliability and availability metrics were mentioned. The results experienced from the APU PBL team show that reliability may not be the best measurement for that system because reliability is difficult to assess. Further research is required to address the types of weapons systems or organizational factors that should or should not measure reliability as a performance assessment.

2. Building the Business Base

Involving Foreign Military Sales (FMS) customers in the implementation stages of PBL was seen as a positive way of increasing the business base for one of the systems. However, this was not pursued in the early stages of the PBL effort and resulted in delayed benefits. There may be situations where this should not be standard business practice. This area warrants further analysis and investigation to identify such potential areas.

3. Analyze Navy PBL Guidance

Comparison of the DoD guidance to the Navy's PBL guidance would provide insight. The GAO findings brought an interesting feature to the research results. As with any high visibility, high dollar value weapon system, political involvement is likely. One interviewee indicated that the GAO was unfamiliar with the complexity of the PBL effort and the findings may have been politically driven. GAO's allegations that BCAs were

not being properly updated at critical decision points may or may not be accurate. Further investigation into the Navy's PBL guidance and comparison to DoD guidance could provide helpful insight about the GAO report and could open possibilities as to why political powers would intervene.

4. Title 10 (X) Impact

Do Title 10 requirements unnecessarily restrict or delay PBL strategies? More than one interviewee mentioned that Title 10 requirements (core workload) had an impact on their PBL strategy. Further research into Title 10 requirements should be conducted to determine whether Title 10 and PBL strategies are incompatible and legislative change is necessary.

5. Applicability to ACAT III Programs

This research focused on the organization design characteristics of people, processes, and structure, and the impact those characteristics have on successful implementation of PBL. The study did not address the impact that particular program characteristics might have on successful implementation. One area that the authors believe should be further researched is whether ACAT III Programs and Systems should be considered as PBL candidates at all, and if so, in what situations? PBL is mandated for ACAT I and II systems because it is designed to work on systems that are high in levels of complexity, visibility, and dollar. The authors believe that applicability to ACAT III systems may be limited or non-existent.

F. CLOSING

The Navy PBL teams have done an outstanding job in their efforts to implement PBL. They quickly grasped the concept of PBL, applied expert direction, and took the necessary measures to make it work. We would like to acknowledge in particular the Navy IPT members for their time and cooperation during the interview process.

The Organizational Systems Framework was used to analyze the information obtained during semi-structured interviews with the Navy IPT members to identify design factors of four Navy programs that have implemented a successful PBL program. By identifying and analyzing the design factors that contributed to the success of the PBL programs, we have been able to draw conclusions concerning certain design factors that

had a direct impact on organizational performance. These conclusions will advance the understanding of organizational congruence and design.

THIS PAGE INTENTIONALLY LEFT BLANK

APPENDIX. TEMPLATE FOR PBL

People: Consider highly skilled candidates			
Skill Levels	High	Medium	Low
- Education	preferred		
- Experience	preferred		
- Dedication	preferred		
- Communication	preferred		
Communications	Defined	Documented	
- Communication Paths/Flow			
- Types of Communications			
Reward Systems	Defined	Undefined	
- Formal	preferred		
- Informal	preferred		
Upper Management	Yes	No	
- Knowledgeable?	preferred		
- Received Training?	preferred		
- Openly Demonstrates Support	preferred		
Remove/Prioritize Conflicting Impediments	High	Medium	Low/None
- Pre-existing Duties			preferred
- PBL Priority	preferred		
- Impact to PBL			preferred
- Roadblocks			preferred

*Communication should be defined and documented

Processes: Consider information resources			
Training and Guidance	Yes	No	Unknown
- Support Offices Established?	preferred		
- Kickoff/Followup Training	preferred		
- Potential Implications	preferred		
- PBL Terms & Procedures	preferred		
- References Available	preferred		

Structure: Consider team functions			
	Yes	No	Unknown
- Use of IPTs	preferred		
- Use of Support Offices	preferred		
- Formal Assignment of IPT Leader	preferred		
- Formal Assignment of PSI	preferred		

Template Narrative

This checklist can be used as a tool to help identify the organizational designs that might lead to successful implementation of a PBL effort.

1. People:

- *Use Highly Skilled IPTs:* Organizations implementing PBL should consider assigning people with high skill levels and high communication skills. Team members to consider are those with advanced levels of education, high degrees of experience, excellent communication skills, and those who display a dedicated attitude and keen desire to excel. Prior to selection, conduct analysis of organization and candidates in order to gather enough data to select the most highly skilled individuals.
- *Establish Roadmaps for Communication:* Communications are a challenge. IPT should establish and formally document communication paths and chains, as well as the type of information that should be shared.
- *Identify Reward Systems:* People/organizations benefit from well-defined awards systems. Upper management support and team buy-in are key design elements that directly impact results, outputs, and outcomes. Are upper level managers knowledgeable about PBL? Have they received training? Do they openly demonstrate support of the concept and IPT?
- *Remove/Prioritize Conflicting Impediments:* Careful identification and consideration of pre-existing duties is necessary in order to prioritize the PBL effort. Stresses from pre-existing duties can negatively impact the motives of team players. Upper level managers should identify and make public the priority of the PBL implementation effort. Potential roadblocks should be identified early and minimized or eliminated.

2. Processes:

- *Provide Consistent Training and Guidance.* Support offices with clear direction regarding training should be employed. Formal and comprehensive kickoff training and follow-up training, including an overview of the PBL concept, explanations of the implementation process, PBL terms, and implications of the application, should be carefully planned and executed by the support office. Useful references should be made readily available.

3. Structure:

- *Use IPTs:* IPTs consisting of all stakeholders and functional representatives should be formed. The members should have prior

experience working on IPTs. Team member roles and responsibilities should be clearly defined. Sometime during the first six months, the IPT should identify a smaller core group of 10-12 individuals involved in daily execution. This core group should be in constant communication. The larger IPT should meet on a periodic, but less often, basis to monitor progress and have input to strategic decisions. The IPT may consider appointing an Executive Steering Committee to do this.

- Use Support Offices: Establish one support office to provide all PBL training. Support office is responsible for BCA preparation but should matrix support to the IPT during this process to ensure team input.
- Formal Assignment of PBL IPT Leaders: Assign IPT leader during IPT formation. Document the assignment and update if necessary.
- Formal Assignment of PSI: Assign PSI at the proper step during implementation process. Document the assignment and update if necessary.

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

- Ahern, M.G. (27 May 2004). Department of the Navy Performance Based Logistics. PowerPoint Presentation;
http://www.acq.osd.mil/dpap/about/Procurement2004/presentations/01_M_Ahern.pdf
(November 2005)
- Boeing, F/A 18E/F Integrated Readiness Support Teaming (FIRST), A U.S. Navy/Industry Partnership to Improve Fleet Support and Lower Support Costs, PowerPoint Presentation, undated.
<http://www.abm.rda.hq.navy.mil/navyaos/content/download/1366/6563/file/8-> (August 2005)
- Bruner, Bradley D. *An Organization Analysis of the Military (Navy) Personnel Plans and Policy Divisions(N13)*, Master's Thesis, Naval Postgraduate School, 1998.
- Department of the Army, Assistant Secretary of the Army, Acquisition, Logistics and Technology. (November 2004). Memorandum, *Subject: Product Support Boundaries*.
- Department of Defense (DoD). (2004). *Defense Acquisition Guidebook (DAG)*.
<http://akss.dau.mil>. (September 2005)
- Department of Defense (DoD). (2003a). *The Defense Acquisition System* (Directive Number 5000.1). <http://akss.dau.mil> (September 2005)
- Department of Defense (DoD). (2003b). *Operation of The Defense Acquisition System* (Instruction Number 5000.2). <http://akss.dau.mil> (September 2005)
- Department of Defense, *The Quadrennial Defense Review*, September 2001.
- Department of Defense, Office of the Inspector General (DoDIG). (August 2004). *The Military Departments' Implementation of Performance-Based Logistics in Support of Weapon Systems*, (D-2004-110). Washington, D.C.: U.S. Government Printing Office.
- Department of Defense, Office of the Inspector General (DoDIG). (August 2003). *F/A-18E/F Integrated Readiness Support Teaming Program*, (D-2003-120). Washington, D.C.: U.S. Government Printing Office.
- Fowler, Randy (October 27, 2003). Performance Based Logistics. PowerPoint Presentation; <http://www.sae.org/events/dod/presentations/2003randyfowler1.pdf>
(August 2005)
- Government Accountability Office. (September 2005). *Defense Management, DOD Needs to Demonstrate That Performance-Based Logistics Contracts Are Achieving Expected Benefits* (GAO-05-966). Washington, D.C.; U.S. Government Printing Office.

Government Accountability Office. (August 2004). *Defense Management, Opportunities to Enhance the Implementation of Performance-Based Logistics* (GAO-04-715). Washington, D.C.; U.S. Government Printing Office.

Government Accountability Office. (February 2002). *Defense Logistics, Opportunities to Improve the Army's and the Navy's Decision-making Process for Weapons Systems Support*. (GAO-02-306). Washington, D.C.; U.S. Government Printing Office.

Harrison, Jeffrey S. and St. John, Caron H., *Foundations in Strategic Management*, South-Western: Mason, OH, 2004.

Hill, Larry W. (2004). Performance-Based Logistics (PBL), Briefing To: DAU TACOM PBL Roadshow, 27 Jan 04, Deputy Assistant Secretary of the Army for Integrated Logistics Support (ILS).

Nadler, D. and Tushman, M., *Strategic Organizational Design*, Scott Foresman and Company: Glenview, Illinois, 1988.

Performance Based Logistics: A Program Managers Product Support Guide (March 2005); https://acc.dau.mil/simplify/file_download.php/ (November 2005)

Poirier, Charles C. *Advanced Supply Chain Management*, Berrett-Koehler Publishers, Inc., San Francisco, 1999.

Roberts, Nancy. "Organizational Systems Framework," Naval Postgraduate School, Unpublished, 2000.

Roberts, Nancy. "Note on Organizational System's Framework," Naval Postgraduate School, Unpublished, Fall 2003.

Schaaf, Wayne, (March 2004). "Memorandum for Program Executive Officer, Standard Automotive Tool Sets (SATS)."

Starks, Glenn L., (December 2004). Defense AR Journal. *Public and Private Partnerships in Support of Performance-Based Logistics Initiatives – Lessons Learned from Defense Agency Partnerships*.
http://www.findarticles.com/p/articles/mi_m0SVI/is_3_11/ai_n13821993 (August 2005)

Under Secretary of Defense, Acquisition, Technology, and Logistics. (November 2004). Memorandum to Assistant Secretaries of the Military Departments, *Subject: Performance-Based Logistics Product Support Guide*.

INITIAL DISTRIBUTION LIST

1. Defense Technical Information Center
Ft. Belvoir, VA
2. Dudley Knox Library
Naval Postgraduate School
Monterey, CA
3. Doctor Cary Simon
Graduate School of Business & Public Policy
Naval Postgraduate School
Monterey, CA
4. Doctor Rene Rendon
Graduate School of Business & Public Policy
Naval Postgraduate School
Monterey, CA
5. Ms. Lynn DeRoche
Executive for Contracting
TACOM Rock Island
Rock Island, IL